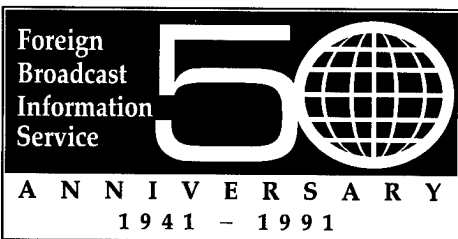


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Air Force Chief Engineer Interviewed on Changes in Support Service

91SV0003A Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 10, Oct 90 (signed to press 15 Oct 90) pp 2-3

[Interview with Air Force Chief Engineer Colonel-General Viktor Mikhaylovich Shishkin by AVIATSIYA I KOSMONAVTIKA correspondent: "The Main Thing is Concern for People"]

[Text] [Correspondent] Comrade Colonel-General, the process of maintaining aircraft and helicopters at combat readiness has grown more complicated with the development of aviation, but there have been no particular changes in the organizational structure of the IAS [aviation engineering service] or methods of servicing aircraft. As far as I know, approaches have now been defined toward the solution of urgent problems. Is there confidence that the correct path has been chosen?

[Shishkin] Such confidence exists. It is based on the fact that the central apparatus of the air force IAS, in conjunction with scientific-research institutions and with the active help of line units, has developed Concepts for the Development of Aviation Engineering Support that incorporate the experience of past years and scientific grounding with a regard for the long term. All of the provisions have been reduced to a system that has made it possible to define basic guidelines for the adoption of new forms and methods of operation, create a unified system for the gathering of information and analysis of the state of aircraft equipment based on the use of computers and improve repairs at the plant and in the field, as well as project ways of raising the quality of the aircraft supplied to the field.

Nonetheless, the main thing is a concern for people, without which even the best of intentions will remain on paper. The new concepts are inherently aimed directly at radical changes in the attitude toward aviation specialists, the creation of the essential conditions for work and rest and the utmost satisfaction of their needs and aspirations.

[Correspondent] More than a year has passed since the adoption of the concepts. This is not a great deal of time, of course, taking into account the scope of what is intended, but what have you been able to accomplish anyway?

[Shishkin] First of all, the preparation of standard documents that will consolidate, on a legal basis, the transformations that have been projected in the IAS is being completed. A manual for aviation engineering support has been developed (to replace the NIAS-78). It was prepared under conditions of broad glasnost and scrupulous analysis of the proposals and observations that have come in from the line units. We tried to make the requirements of the documents closer to the needs of the specialists and avoid formalism in the organization of their labor. This same approach was also applied toward

preparing the organizational and methodological instructions for the whole training year. Steps have been taken to reduce considerably the quantity of documents sent to the field.

Second, conversion to a system of operating aircraft using servicing and maintenance crews is now being completed in frontal aviation, which provides greater opportunity for the independence of specialists and provides for autonomy in the performance of combat-training missions. Their adoption is proceeding in fine fashion overall, although there are difficulties as with any new matter. They are brought about by the understaffing of the units and the inadequate level of their professional training in accordance with the new requirements. Many more technical, organizational and social problems will have to be resolved, but the new system will make it possible to service aircraft equipment in higher-quality fashion and to ensure its reliability in operation. It is being checked out, as was planned, for application in the units of military transport aviation, and such an experiment is projected to be conducted in long-range aviation at the end of the year.

And third, a unified and comprehensive system for the gathering, processing and utilization of information from object monitoring equipment is being created. The formation of centers for diagnostics, forecasting and evaluation of the condition of aircraft and rules for their operation and use is being projected for the future. All of this will provide for the accumulation of statistical materials and the creation of databases to account for the individual specific features of each aircraft, which will make it possible to convert to their operation and repair according to their technical condition. This will soon become a reality. Much preliminary work is beginning to bear fruit—the series manufacture of dozens of the highly productive mobile flight-information processing device—the Mayak-85M—has begun, and they are already being supplied to the units.

Methods of automatic real-time monitoring of the condition of aircraft and the actions of the crew in flight with the transmission of the information to the ground have also been developed over the last year within the framework of scientific research. Laboratory testing and flight experiments that have been performed make it possible to conclude that the work that is underway is promising, and that means that the adoption of the techniques being researched will lead to a rise in the quality of operation of aircraft.

[Correspondent] These measures obviously have a "human" aspect as well as a purely technical one?

[Shishkin] Undoubtedly. The adoption of new and "smarter" technology makes enhanced demands of man, but it opens up broad prospects to him at the same time. It is no secret that one of the reasons there is no time for specialists to improve themselves, profoundly study the essence of the work they are performing and allied fields and, finally, simply rest is the abundance of routine and

mechanical work. Machinery should shoulder it, giving people greater opportunity for creativity. Today we are persistently seeking ways of saturating the units and aircraft-maintenance depots with computers with the future creation of a unified computer-information system. It is a very difficult task, but we will be unable to restructure our activity in any radical way without it.

The computerization of the aircraft-maintenance depots is proceeding at a faster pace, albeit still an insufficient one, in my opinion. The Air Force Scientific-research Institute has developed Concepts for improving the aircraft maintenance of the Air Force on the basis of information technology, and that work has thus received a solid methodological foundation. We are hoping, in the next five or six years, to equip them completely with modern computer technology, which will make it possible to increase radically the efficiency of the performance and quality of repairs. The new management mechanism is already partially undergoing a practical run-through, under conditions of market relations and self-financing, in the manufacture of consumer goods at the aircraft-repair facilities and the output of products for other ministries and agencies.

[Correspondent] What are the new relations of the Air Forces with the design bureaus and the enterprises in the aviation industry under the conditions of economic accountability [*khozrashchet*]? What must be done so that the aircraft equipment coming to the units corresponds fully to Air Force requirements?

[Shishkin] The conversion of the enterprises of the Ministry of the Aviation Industry [MAP], the aircraft-repair facilities and the NIU [Scientific-Research Directorate] of the Ministry of Defense to the new business relations, along with the reductions in budget appropriations for the Ministry of Defense, have placed before us the necessity of reviewing our relations with the developers and manufacturers of aircraft. The set-up of fundamentally new ties, of course, is not proceeding easily, but the correctness of this approach is obvious. Can it really be considered normal when the aircraft arriving in the units take years to be brought to the assigned parameters? Thousands of bulletins with millions in spending are being executed therein. The right of the customer to pay money according to the realization of the contract gives him a powerful tool for managing quality. The Air Force NIU has already begun to make use of that right. I feel that in the future every Air Force organization, including the line units, and not just the NIU, must be given the opportunity of concluding direct contracts. The conversion of mutual relations with industry to new terms will facilitate the faster adoption of new, interesting and useful technical solutions proposed by innovators in the Air Force, and not only by the developers. There are examples of this already, by the way. The Mayak-85M integrated system for objective monitoring that I have already mentioned, which has been put into series production at enterprises in the industry, was developed by the collective of the Riga Higher Military Aviation Engineer Academy imeni Ya.I.

Alksnis. Some MAP enterprises have begun to put out small-scale mechanization equipment for preparing aircraft and weapons systems according to proposals that came from the units. This collaboration must undoubtedly be expanded. We are all still in the deep debt of the specialists of the IAS, whose work is not only complicated but physically difficult as well. A system of measures is needed that would put all collectives engaged in the development, manufacture and operation of aircraft under conditions that would be advantageous for a rise in the quality of engineering and an improvement in the working conditions of the aircraft specialists. It must unfortunately be noted that the economic situation in the country and the absence of personal responsibility for the end results are having a negative impact on the fulfillment of the plan of measures to provide for the working conditions of engineering and technical personnel in the operation of aircraft equipment that was approved by the Commander-in-Chief of the Air Force. The industry has been unable to handle the order for the development and delivery of protective gear and new types of work clothes and footwear for the engineering and technical personnel.

Decisive steps have been undertaken to rectify the situation. The commander-in-chief of the Air Force held a conference on August 10 that selected prototypes for the work clothing and footwear for production.

Our proposals for industry enterprises to pay for modifications performed by field units and aircraft-repair facilities on aircraft under guarantee, as well as for extending their service life, have not been realized as of the present time. We must establish a procedure under which payment for the elimination of defects in aircraft is made by the culprit. Good work should be additionally rewarded as well. This procedure must also be instituted in the units. Material incentives for raising quality at aircraft-repair facilities must be employed more widely, and wage leveling and the alienation of people from the means and results of labor must be overcome.

[Correspondent] It is now apparent that the resolution of the tasks facing the aviation engineer service is impossible without competence and intelligent initiative from the supervisors and the executors. What is being done to raise the level of training and responsibility of the IAS specialists?

[Shishkin] Fundamentally new courses of combat training for the engineering and technical personnel (KBP ITS) are being developed and incorporated in order to organize the systematic and differentiated training of engineers, technicians and mechanics in the rules of operation for specific types of aircraft equipment. Each specialist will receive an individual qualifications booklet in which will be recorded the level of professional mastery he has achieved. This level will be the determining factor in resolving issues of promotions, submission for awards and the like.

Improving the system of training for key engineering and technical personnel at Air Force higher educational institutions is of no less importance. Refresher training for engineers in line units has been organized at a number of the higher military aviation engineering schools and at the VVIA [Air Force Engineering Academy] imeni Professor N.Ye. Zhukovskiy. Certification of educational institutions has been performed with a regard for the fulfillment of requirements posed for the level of knowledge acquired by the graduates.

The aviation engineer service, however, as a consumer of personnel, is encountering substantial difficulties caused by shortcomings and imperfections both in the system of general education in the country and in the armed forces. Solutions that are not thought through are affecting the people. An imbalance in the number of aviation engineers graduated by the higher educational institutions and the number of job slots, for example, has led to the fact that many of them wait for years for assignment to their first engineer positions. The needs of the line units for specialists with the skills of programming and operation of modern computer technology and automated control systems are not being fully met. This is also making the transition from quantitative parameters of evaluating the operations of aircraft equipment to qualitative ones more difficult, and is having an effect on the work of every specialist and the IAS overall.

We should, in posing requirements for the professional training of the IAS personnel, be concerned with their social protections as well. Can a specialist fully realize his potential if he is not provided with everything necessary? A question that needs no answer. We now have to catch up with what was not done before, under conditions of universal scarcity and production and economic difficulties.

Our difficulties are being aggravated by the withdrawal of troops from Mongolia, Hungary and Czechoslovakia and the preparations for their withdrawal from Germany and Poland. The significance of the economy and the efficient investment and utilization of resources is increasing now as never before. The more we are able to economize through improvements in the operation of aircraft equipment and the careful consumption of matériel, the greater the resources we will be able to direct toward social measures in addition to what has been allocated. We cannot cut corners with people.

We have been able to achieve a thing or two already. A new procedure has been instituted, for example, for categorizing the engineering and technical personnel associated with the servicing and repair of aircraft, and pay has been established for high qualifications.

[Correspondent] Comrade Colonel-General, please tell us about the principal stages of your service in the Air Force. What do you remember the most? What would you wish for the young officers?

[Shishkin] I was born into a service family—an aircraft engineer. I have known aviation since my early years in

garrisons. The Great Patriotic War found me in Minsk, at a military airfield. I was evacuated to the Urals and then to a children's home, where I knew all the difficulties and deprivations of the war years. I was educated both in the family and at the home, and my habit of hard work helped me very much in life.

My wife was a physician, and is now a housewife. My son and daughter completed the institute of foreign languages and are working in their fields. Two of my brothers and I completed the Air Force Engineering Academy imeni N.Ye. Zhukovskiy, while another brother is working as a mechanic at an aircraft-repair facility.

After completing the academy in 1954, I served in all regions of the country from the borders of the Far East to the West, and had occasion both to work on equipment with my own hands and to supervise the aircraft-engineering services of units and formations. I have been the chief engineer of the Air Force since 1986. My most vivid impressions remain from the start of service in the Far East Military District. I was lucky with my commanders, people I could take as a model and learn from. No one can ever forget how difficult it is to be a lieutenant. The whole life of the officer depends of how his service begins. I want to wish the young—and not only the young—to value their professional dignity, whatever the rank they hold: increase their technical and general education, knowledge and skills, love engineering and do everything to see that they are always in a combat-ready state. To seek non-standard solutions to problems and not to fear speaking their mind. And, of course, to respect the opinions of others and listen to them. We all learn from each other in the school of life, after all. An engineer or supervisor who thinks only about himself is not suitable today. However complex and important your equipment, the person is more complex and important still. And since more than half of success depends on the ability to work with people, it is essential to be in close, everyday and comradely contact with them, delving into their concerns and fears with utmost concern for subordinates. Every opportunity for this must be sought. Then, however hard it may be, we will be able to fulfill our soldier's duty to the Fatherland through joint efforts.

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Air Training Attitudes Praised

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pp 4-5

[Article by Colonel A. Dmitrichenkov: "Missile-Carrying Aircraft *En Route*"; conclusion of article from No. 9]

[Text] 2. Point of Reference—High Reliability

I am hurrying to the classroom building with the regimental commander. All the flight personnel are already

there for pre-flight instructions. The sun gains in height. The sparse waves of clouds seem to be rooted. The sky is hot like in the south.

"A great little day," Pavel Vasilyevich assesses the weather on the move. He said it as if running his hand over the "little day." And he added, "The boys will fly."

The overwhelming majority of the pre-flight instruction session really was young officers.

"Start of flights... Weather forecast... Aerial situation... Ground situation... The daily ready schedule..."

Androsov's voice was even and clear. The pilots reacted instantly to all of his questions and remarks, grasping every word. The flights promised to be intense. It was felt overall that people were inclined to battle, all were in the power of the impending flight shift. And looking into their courageous and inspired faces, you understand that they are among those for whom reliability is the sole constant value. Jumping ahead, I will say that this time the flight personnel and specialists of the IAS [aviation engineering service] performed in "excellent" fashion.

Reliability... They are talking about it in the regiment today, as they say, at the top of their voices. And there are grounds for it, the experience accumulated in recent years. That includes both the professional satisfaction of the fliers and the changes in their mood in relation to the service and training.

I have had occasion to converse more than once with those who had gathered that "baggage," thought it over and "adapted" to the modern day one way or another. And they all said with one voice, "We are operating under actual combat conditions on every flight, without simplification or lessening."

Just what is the essence of the Guards fliers' experience? The comprehensive run-through of KPB [battalion command post] exercises, in my opinion. They have been solidly taught bombing runs in mixed-speed flight configurations. They have mastered methods of spatial countermeasures against "enemy" AA missile systems with the aid of programmed PPI calibration firing and their utilization in waves. They strike in masterful fashion at subsonic and supersonic speeds from short bombing runs. They fly in formation in pairs at night without using BANO at subsonic and supersonic speeds, which rules out the effective combat utilization of AA defense. The regimental arsenal of tactical devices looks quite imposing even when only partly listed.

Who today does not know that military science is enriched more than in the offices of scholars, laboratories and on proving grounds alone? Its living and inexhaustible source is the everyday life and training of units and subunits and an inquiring approach to their organization by commanders. This is also confirmed by the constantly improving proficiency of the Guards fliers. What that is new could you find, it would seem, under the conditions of a squadron or regiment, where a

well-shaped and repeatedly tested system exists, the more strictly regimented instruction and manuals?

But is that really so? We turn to those same instructions and manuals. They contain the requirement to employ the provisions and recommendations that are set forth in a creative manner, with consideration for the situation. Life itself also convinces us that without inquiry and an inquiring approach, without the active incorporation of everything that is new and progressive into practice, it is impossible to assimilate the complex methods of waging contemporary battle to perfection, to ensure high combat reliability.

How, for example, do the fliers practice their operations in mountainous terrain? The routes are selected along linear reference points (ravines, valleys) for reliable visual monitoring of the flight. The combat formation is a column of strike groups from reinforced detachments at time intervals of four minutes. The detachment is echelon right by pair intervals at distances of two kilometers. The flight on the route is conducted under radio silence. After carrying out the strike, the missile-carrying aircraft use energetic maneuvering to escape...

The fliers came to these tactics as the result of a synthesis of standard requirements and practical experience.

The view that is current among many commanders of the techniques of combat training as something unchanged, fixed, strictly limited by the hand of instructive documents is unfortunately often a clear psychological barrier impeding an innovative approach to the work, and does not permit the energetic application of research methods in it. When I took interest in this and asked Androsov about it, he answered without ceremony, "Life itself demands corrections in a technique that provided the necessary quality of training for the fliers as recently as yesterday. It need not be repudiated entirely, it should serve as a basis for further work. It is simply impossible to progress without it."

Yes, it is good when these corrections are the result of collective creative inquiry. Collective experience, as is well known, is always more substantive and richer than personal experience, since it absorbs all the best that has been achieved by many people over a long period of time. It is thus aimless to speak of innovation in work without interpreting that experience to the full extent. Only enriched by it, grasping all the nuances of one's business, can the fliers of the regiment take a step forward, rise to a new level of professional skill. The personal experience of the leaders of combat training—Guards Colonels V. Buz and V. Parshin, Guards Majors V. Bocharov and V. Shabanov, Guards Captains S. Bezuglov, N. Zhikharev, I. Molotok and N. Shumakov and Guards Senior Lieutenant A. Khalyapin—was truly the source for the replenishment of the collective in this sense. This is possible naturally when each flight becomes a process of seeking the most optimal and effective ways of resolving combat-training tasks, and

everything that was born therein is summarized, analyzed and passed along in interested fashion to others.

The attitude of Guards Lieutenant-Colonel A. Libenkov seems instructive in this regard. Aleksandr Nikolayevich did everything to see that the navigation service occupied a leading place in the combat training. Why do matters proceed successfully? For the reason that behind his 20 combat sorties, qualifications as a crack navigator, the orders of the Red Banner and the decoration "For Service to the Motherland and Armed Forces of the USSR" 3rd Degree are not only his personal knowledge and experience, but also the whole combat "arsenal" of his comrades. Only through such a profound understanding of collective labor does a careful attitude toward the work of each person arise.

And there are many such "treasure hunters" in the regiment. That is why each pilot, navigator and aircraft specialist knows very well that his diligence and conscientiousness are visibly valued, whence the efforts to fulfill flight assignments in quality and reliable fashion. The command, party committee and instructors' council do everything possible to see that the fliers move that way through the strict observance of flight discipline and personal example. Courage, self-possession and a thorough knowledge of the aviation complex is characteristic of many here. These qualities have come to the aid of some aircraft commanders more than once now.

Anything unexpected can happen in the air. And the pilot should feel the situation according to the slightest traits. Say, a barely noticeable fluctuation on an instrument needle. One must constantly be prepared to make the sole correct decision, virtually instantaneously, on which the lives of the crew and the life of the craft will depend... And after all, some of them have all sorts of things in their service records.

Aircraft commander Guards Captain S. Kushch was performing a performance-graded flight at an altitude close to the practical ceiling. The instructor was Guards Lieutenant Colonel I. Degterov. The left engine was turned off at 7,200 meters according to the assignment. And then they couldn't start it up again. They made two more attempts, at 6,000 meters and at 2,000 meters. No results. The crew had done everything possible. And it was not his fault that the "left" did not come back to life. The unsuccessful flight was aborted. But the aircraft landed safely.

Aircraft commanders Guards Major N. Chesanov and Guards Captain A. Dobrynin, among others, also acted in such skillful and cold-blooded fashion in non-standard situations. The "reliability reserve" of the winged craft let them all down, but reserves of courage and professional skill saw them through.

In talking about what is positive in the aviation regiment, one cannot say that the life and service of the aviators proceeds without a hitch. They have their own unsolved problems. The guaranteed reliability of the aircraft equipment does not elicit any satisfaction among

the fliers. The sharpest and, in my opinion, the most justified reproaches were directed against the MAP [Ministry of Aviation Industry]. There is not enough small-scale mechanization equipment at the airfield, technicians and mechanics are in short supply...

Everything here is not fine in the resolution of housing issues either. No one, after all, would now deny the direct link between the everyday amenities of a person and his zeal, energy and initiative in service. I was talking about that with the party committee secretary, Guards Major V. Bandyukov, and other senior officers. Their opinion was unequivocal: "Restructuring should be accomplished by the people and for the people." Hard not to agree.

What does this entail? An unequivocal psychological state of the fliers investing their whole heart, without exaggeration, in their business, in their aircraft. And the regiment, after all, is dozens of officers and warrant officers and the members of their families, it is an everyday life that is to a certain extent fixed with a definite clarity of perspective. In this case, I think, it is a difficult task to resolve what is needed not only in the regiment, but at a higher level as well.

I left the military garrison around evening. At the airfield, returned from their long-range routes, both the aircraft and the people were resting. And only the doves were indefatigable. Now came the muffled voice of a soloist. She was immediately answered by a host of other birds—young, with ringing voices. They are not silent here, on the ground, while up there, in the sky, the missile aircraft of long-range aviation are keeping watch.

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Cadets Participate in Tactical Air Exercises

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pp 6-8

[Article by Candidate of Technical Sciences Colonel N. Litvinchuk: "The 'Cadets' Waging Battle"]

[Text] *The tactical air exercise [TAE] is an accustomed matter for the personnel of line units. This test was largely unusual for the cadets of the Chernigov VVAUL [Higher Military Aviation School], taking part in the school's TAE as part of a mixed air regiment for the first time, and required maximum intensity of spiritual and physical forces. The conclusion, no matter how strict the observers—representatives of higher headquarters, schools and line units—were in their assessments, however, was unequivocal: the TAE was successful, and the cadets acted in combat fashion.*

The reconnaissance aircraft appeared unexpectedly over the airfield. The operators of the radar stations reported that an "enemy" strike group was following them. A pair of fighters aloft on combat air patrol went in to meet

them upon command from the ground. The cover aircraft intercepted the attackers, and they were forced to employ defensive maneuvers. The aerial battle had been joined.

The "enemy" had accomplished what had been intended—taking on the fighters alone, diverting them away from the main forces. And they had already begun their "black deed." The attacks on airfield facilities followed one after the other—from dives, chandelles and immelmans—and energetic maneuvering against air defense was performed.

The raid lasted less than 12 minutes. And although the "enemy" had been unable to achieve his ultimate aim—to incapacitate the airfield and support the operations of his own reconnaissance and sabotage groups—it showed that he was ready to wage battle on equal terms.

The operational situation became more complicated. A squadron of ground-attack aircraft received the mission of redeploying to a different "point." Takeoff by flights. Cadets in the cockpits. They first headed toward a false airfield in order to confuse the opposing forces, dropped below the radar horizon and headed for the assigned field, landing in pairs. They also did not fly the route without patrol escort.

It was not easy for those who were performing this mission. Each group of ground-attack aircraft had to be met at an assigned intercept line, and "enemy" fighters could not be allowed to get to them. Aerial battles were joined once again. This is where precise calculation and skill were needed.

The aircraft specialists on the ground set about preparing the aircraft for their next sorties without delay—replenishing the fuel and mounting the ammo loads for the rocket launchers.

The second day of the air exercise proceeded.

The voice of the squadron commander, Maj S. Kozachenko, sounded clearly and confidently: "Combat orders follow..."

And the cadets lifted off into the sky once again.

It had not been easy for the school to prepare for the TAE. There were neither standard documents nor documentary experience for conducting it. The commanders first had to work on creating instructional elaboration and then use all the force of their conviction to obtain permission to demonstrate the potential capabilities of the flight training for the cadets in a new way. Lieutenant-General Aviation N. Kryukov must receive his due. His "OK" gave the green light to the realization of intentions, even though there was undoubtedly some official job risk for many of the superior officers. But there was also sober calculation, faith in people and in their combat proficiency.

The initiators of the training were prosecuting the following aims. First, teach the instructional corps of the

aviation units and subunits of the school the planning, organization and execution of a TAE with the cadet corps. Second, acquaint the students in practice with the organization of combat operations in interaction with ground forces.

The practical tasks included conducting aerial reconnaissance, destroying ground targets, tracking and intercepting targets and aerial battle, transfer to new base locations, covering troops against strikes by ground-attack aircraft and fighting "enemy" aerial reconnaissance, as well as getting out from under a strike.

The following scenarios were envisaged: repelling an attack by sabotage and reconnaissance groups; vectoring fighters under conditions of radio interference; overflying a "radioactive" cloud by ground-attack fighters and their decontamination after landing; and, executing a "nuclear" strike against an airfield and fighting its consequences.

Subunits using L-39 aircraft were brought into the mixed air regiment according to the plan for the TAE—young pilots from among the fourth-year cadets (as ground-attack pilots) who were completing training for instructional work—along with permanent flight personnel, who were entrusted with the mission of fighters for their own side, as well as the "enemy" fighters and reconnaissance and ground-attack aircraft.

The airfield activated basing, firing and tactical ranges and false and reserve runways. Cadets from the first three classes took part in the execution of ground operations along with the support units.

The instructors of the training department conducted the theoretical accompaniment of all fragments of the TAE. Comprehensive group practice on the topic of the exercise was conducted with all personnel immediately following the transmission of the commander's intent. Pilots substantiated their actions according to the scenario instructions and the missions. The answers were not always irreproachable, required supplementation and elaboration and evoked disputes—training! And beforehand, in accordance with the plan that had been developed, the cadets and pilots had mastered advanced aerobatic maneuvers at low altitudes and expert-level ones at medium altitudes, aerial group combat, strikes against ground targets and elementary and advanced types of maneuvers. The store of knowledge on tactical and special tactical disciplines was replenished. Here is what Col Yu. Sidorov says about it: "The personnel worked from morning to night without being pushed before the TAE. Crews were prepared, various versions were run through. The young men faced the same missions as the experienced ones, and they did not want to give in."

At the same time as the commander's intent was being passed along and the preparations for fulfilling the assigned missions were underway, a pair of "enemy" helicopters had secretly landed a sabotage and reconnaissance team 5-10 kilometers from the airfield. They were

first-year cadets who had completed training under the program for special subunits of foreign armies. Their mission included penetrating the "point" undetected and disabling its important facilities and command and control posts.

The "saboteurs," after a rapid forced march, reached the perimeter of the flight field, and began reconnaissance and "destruction" of poorly defended facilities in an attack in small groups at dusk. A strike by all the forces was carried out in the morning...

Up to that time the airfield had been guarded by second- and third-year cadets, along with other subunits. Their mobile raiding parties in combat vehicles (BRDMs) fulfilled their missions in clear-cut fashion overall.

Lt Col D. Chernyavskiy elaborated on the purpose of involving cadets in exercises on the ground: "The air commander should know more than how to fly, bomb and strafe alone. He is also obliged to know how to organize the effective guarding and defense of his own facility. It is difficult to do this without experience. It was namely those personnel who had completed saboteur-reconnaissance training in the past that played the chief role in repelling the attack."

The mass attack by "enemy" aviation that has already been mentioned began at the conclusion of the battle on the ground to support those that had suffered defeat, while the ground-attack aircraft that had been redeployed to the airfield after that received a new assignment. It included reconnaissance in the areas of combat operations and the detection and "destruction" of ground targets. Counteraction to the "enemy" fighters was also proposed.

The attack group thus consisted of aircraft for the suppression of target AA defense, follow-up reconnaissance and designation, a strike group and patrol escort. The targets on the range were camouflaged, which ruled out the over-simplification of the situation and did not permit either the cadets or experienced flight instructors to slacken.

The group, having overcome the resistance of "enemy" air defenses and aviation, reached the range and began operations by flights. The first attack run was the break-up of the flight formation and the preparation of weapons systems. The second was the firing of air-fired rockets at a dive angle of 30°. Simulated fire was executed in subsequent attacks from chandelles and immelmans. The results proved to be good. The cadets moreover shot better than the regular personnel. The actions of the fighter aviation of the opposing side were also highly regarded.

The fact that cadet A. Savichev had to land at an intermediate airfield due to a lack of fuel testifies to the complexity of the aerial situation. The senior officers of the TAE made the decision calmly and without fuss. A flight to the base airfield then followed, and the cadet

was already part of the next squadron sortie. The positive role of this episode in the emergence of young pilots is undoubted.

This is, of course, a prelude to a flight accident under normal conditions. In order to avoid it, according to the laws of dual ethics, the command could have been given to go to his own airfield—there was barely enough fuel, but it could have been enough. But if he were suddenly forced to go around? It is no secret that many flight accidents were the result of such actions. Sober calculation and faith in the training of the pilot, so often lacking here, predominated in this case. The cadets were ready for this anyway, as the flights were being executed at maximum range.

The third day of the tactical air exercise came. And again the assignment to fly on a routing to reach the range. Combat firing. The flight-instruction staff distinguished itself this time. The results of the cadets were more modest.

But a new test was lying ahead—the overflight of the "radioactive" cloud. Cockpit pressurization was cut off, the pilot was attentive to the utmost. But there is the airfield. Clean landings in pairs—as if there had not been the tense flight with its tactical problems beforehand.

On the ground each aircraft, before taxiing to the hardstand, was decontaminated using gas-liquid methods with the aid of special vehicles. The specialists, under the command of the experienced teacher Lt Col A. Samilenko, demonstrated their mastery here.

But the "enemy" gives no breathers. Another raid. His aircraft are overhead. The fighters try to break off the blockade of the airfield, penetrate to the strike group. But the cover group, executing the "screw" attack maneuver, deflects them from the main force, forcing them to engage in aerial battle. A carousel of four ground-attack aircraft are circling over the targets at the same time. It is uncomfortable being on the ground at such a time.

The training is approaching its conclusion. The "enemy," according to what has been ascertained, intends to employ "nuclear" weapons against the airfield. The ground-attack aircraft have a new mission—get away from the strike and redeploy to another airfield. One of the flights has to "destroy" the "enemy" assault along the route (strike targets on the range).

The aircraft are prepared for departure, and the pilots quickly take their places in the cockpits, start the engines and, as opposed to usual practice, taxi to the runway at both ends. They will take off in pairs in different directions. The silvery craft shoot easily into the sky after a short takeoff run at minimal intervals. Then they assemble, fly over the "point" and head for the routing to perform their assigned missions.

A powerful explosion sounds at that moment at the airfield and a mushroom-shaped cloud begins to rise

quickly. This was the finale of an excellently played show—the TAE at the school. Special commands came to eliminate the consequences of the “nuclear” strike.

Pilots Majors V. Zhuk and V. Pugin, Captains I. Andreyev, A. Sidorov, Ye. Sherstyukov, Yu. Timofeyev and Ye. Mukinin, Lieutenants E. Barashkov and A. Godovanik and Cadets O. Zakharchuk and A. Gritchin, among others, showed themselves at their best in the TAE.

Many warm words were addressed by the commanders to the engineering and technical personnel, the command and control posts and other support services for the exercises. The style of party political work has also changed appreciably. The hue and cry, shouted slogans and unneeded fuss of meetings has disappeared. A clear-cut organization of the whole process of training and conducting the exercises was felt. Political workers Lieutenant-Colonel E. Burtsev, Major M. Chmykhov and party committee secretary Major V. Ustenko made their contributions to this.

Colonel V. Sobolev, in summarizing the results of the tactical air exercise, revealed the reason for holding it: “We understood from the feedback from line units on graduates that we are giving them specialists with flying skills alone, and the training is poorly tied to the achievement of the ultimate aim—the training of the combat pilot. It was felt that that was the prerogative of the line units.”

They had to turn to tactical air exercises to seek a way out of the vicious circle. Strict and unequivocal requirements for the programs of flight and theoretical training, a request for the tactical and special tactical disciplines lying at the heart of tactical flight proficiency, appeared at once.

A problem arose at the same time—how to bring cadets with limited flying time and training time at the academy up to flight training at the TAE level? Such questions were considered utopian before this. But we wagered on making the human factor more active—we converted to efficient techniques for flight training and appealed to scientific organizations for help. This made it possible to reduce the quantity of flights to master the tasks of flight training and to institute new training exercises. The use of the new techniques, for example, made it possible to reduce the average dual-instruction program on combat aircraft from 44 flights to 12. It was the same way for all the other tasks without reducing the quality of training.

The stress on theoretical training led to the necessity of instituting a new subject—theoretical accompaniment for flight training. Flying instructors in the training department, and then pilot-psychologists in the squadrons, appeared at first as a result. But even that proved to be insufficient. It became clear that a pedagogue should be a pilot-instructor first and foremost.

Some 32 flight instructors completed courses last year at the school in the disciplines of tactics, practical aerodynamics, the combat application of aviation weaponry and aircraft navigation. It is proposed to have four such teachers in each squadron starting in 1991. But all of this is still on an informal basis, and official recognition of their status is needed.

They have been moving gradually toward what is planned at the school, by trial and error, overcoming various obstacles. The tactical air exercises were conducted using trainers in two squadrons in 1987 for the first time. Subunits of combat aircraft began to be brought in the following year. The TAE was conducted in all squadrons in 1989, and today it is comprehensive at the regimental level. And that is not the limit. This endeavor, however, requires a consolidation of the training program for the fliers, starting with the special boarding schools and finishing with the line units.

And what is the customer's point of view on this? The senior officers of combat training are continuing not to notice what is new in the work of the flight schools. A five-level system of training flight personnel for the period to the year 2000 has been developed, according to the statement of Maj Gen Avn V. Stepanov (at a conference in July of 1990). A pilot, according to it, will reach the peak of his skills 10-12 years after joining the line unit. However, as regrettable as it may be, we figure the life cycle of the pilot here at only ten years.

Everyone I talked with, speaking with admiration of the exercise, was concerned for the future of this event. The unease was caused by the fact that such an endeavor cannot be undertaken on the enthusiasm of strong personalities alone. They will move on—and won't everything come full circle once again?

And after all, we so want to believe in the restructuring of combat training for cadets.

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Fighter Training Deputy Chief Replies to Critical Articles

91SV0003D Moscow AVIATSIYA I KOSMONAVTIKA
in Russian No 10, Oct 90 (signed to press 15 Oct 90) p 9

[Letter to the editor by Colonel T. Sheshenya, deputy chief of Fighter Aviation Combat Training of the Air Force (Moscow), and editor's reply]

[Text] AVIATSIYA I KOSMONAVTIKA (1989, No. 12 and 1990, No. 5) has published articles by A. Korotchenko—titled “You Have Become a Pilot 1st Class. What Next?”—and A. Zhukov—titled “Half Measures Will Not Suffice”—that expressed, in the opinion of the editors, a number of interesting proposals. No. 5 also contained a reproach directed at the air force combat-training directorate for supposedly ignoring desires affecting the vital interests of the flight personnel.

The features did not go unnoticed by the specialists in combat training at the Air Forces. No reaction followed to the first article, however, for the reason that it contained no constructive suggestions. The patent tentatiousness of the author and disrespect for collective experience in organizing flights that exists as a code of flight laws—the NPP—can, on the contrary, be clearly discerned. The words, “With a red cover, because, they say, it was written in the blood of whole generations of fliers—such is what they instilled in us” are blasphemous in regard to the memory of lost fliers. Many of them really did inscribe whole articles in the manual at the cost of their own lives. And that does not need to be “instilled” in true professional fliers.

The cynicism of Korotchenko’s statements is more than surprising to us. The author pretends to a high level of professionalism in his opinions on the procedures in the Air Forces and the system of combat training, when in reality he writes like an amateur and a dilettante. Major Korotchenko has evidently long been at odds with the documents, and he has not held the NPP since they were published if he doesn’t even know the color of the cover.

Most of the measures proposed by the authors to raise the combat readiness of the aviation units have already been developed by Air Forces combat training and adopted into practice. And both the authors and the editors should know that.

New combat training courses for the branches of aviation were instituted in 1986 (and the KPB-92 is being prepared for publication), followed by the NPP-88 and the promulgation of the Ministry of Defense order “Classification of USSR Air Forces Flight Personnel”; changes have also been made in the techniques for organizing combat training. Commanders and pilots have obtained an opportunity to determine the flight plan, the flight assignments and the amount of, and procedure for, training for them in creative fashion, displaying initiative, as a result. Combat training in the Air Forces has in recent years persistently inculcated fliers with independence and a feeling of personal responsibility for the end results of the flights they make. We feel, at the same time, that this does not take responsibility away from the teaching commanders either.

We not only permit, but constantly insist and even demand, that the aircraft be assimilated to the full extent of their combat capabilities. The results of exercises conducted under the leadership of combat training for the purpose of evaluating the aerial and tactical flight proficiency of units and subunits testify to this. The introduction of the category of “sniper” was also aimed at raising the level of personnel training for the fulfillment of combat missions. No few measures have moreover been undertaken in recent years to provide incentives for flight work. The monthly payment of the monetary pay supplements for special service conditions, instituted in January of this year, testifies to this as well.

Air Forces Combat Training is developing proposals to improve the system of incentives for flight work. They are directly linked with the maintenance of pilot readiness for the fulfillment of their combat missions according to the purpose of the aircraft being operated. But we do not feel that there is no need to improve the existing system of combat training. We favor improvement and constructive dialogue, not confrontation. We must find ways of resolving problem issues together.

I would like to emphasize in conclusion that the editors of AVIATSIYA I KOSMONAVTIKA should approach the search for authors and the selection of material on topics of combat training and flight safety in more considered fashion, and edit the material with knowledge of the matter. It would be expedient to print articles aimed at raising the level of combat proficiency and flight safety and cultivating a feeling of personal responsibility for the observance of the laws of flight service under the rubric “Combat Training and Safety...” And to display more professionalism therein, not admitting into publication materials of dubious content that in no way add to the reputation of the journal among fliers.

There is no need to “break down an open door.” The doors of Air Forces Combat Training are always open to all who are striving to improve the system of combat training.

From the Editors:

This is the reply we received from the Air Forces Main Staff to articles that were, as we clarified, noted as being most topical by the fliers of line units. The chief question remains an open one, since the viewpoints expressed in them are diametrically opposed: “Just who is right and where is the truth?” The editors appeal to all fliers with the request that we conduct a principled and candid discussion in the pages of the journal about what is hindering the efficient learning of martial skills, and what the drawbacks in the existing system of combat training consist of. Remember, your passivity in this discussion, your fear of expressing yourself, will lead to the fact that he who has the most rights will always be right.

The reproaches of Colonel T. Sheshenya directed at Major A. Korotchenko can hardly be deemed fair. The point is not the cynicism of the pilot. The first NPP-38 (from 1938) noted that “This document has been written with the blood of lost fliers...” It has turned out that this emotional sentence has been passed along by fliers from generation to generation and used to “scare” cadets at service schools. It was being repeated especially often in 1971-78, when the NPP really did have a red cover. We would note that it was namely during those years that Major Korotchenko completed his emergence as a pilot. So what is he guilty of? That he was subjected to the influences of a primitive ideology?

And last. The editors thank Colonel T. Sheshenya for indicating how to approach the search for authors and select and edit the materials. But they will scarcely be

able to do it, since they adhere firmly to the principle that any flier can appear in the pages of the journal on any issue. Articles, and even speeches at meetings, have been edited to suit someone in our society for too long. What it led to is obvious. We will thus conduct the debate on what is hindering us from efficiently "Learning What is Essential in War" in the future as well. Glasnost and pluralism, after all, are not a game with a goal at just one end. What do you think, dear readers?

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Problems in Reorganizing Aviation Rear Support Described

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pp 10-11

[Article by Lieutenant-Colonel V. Verses, commander of an aviation technical base, under the rubric "Combat Training: Problems of the Rear": "Across the Abyss—In Two Hops?"]

[Text] We rear-services personnel have now somehow gotten used to the coverage of our life by the mass media, including by the journal AVIATSIYA I KOSMONAVTIKA. Either bad or nothing at all. But now articles have appeared literally of late that, I hope, lay the foundation for a candid discussion of the life's work of the combat support units. I have served in them for many years, my heart aches about much, I have thought over a great deal and thus I cannot remain on the sidelines.

What, it would seem, is there to write about the old? A new structure, after all, has now been worked out and incorporated in the support units. Large changes are underway. But far from everywhere, and not in everything. In some places they have just "changed the signs," calling the same *obato* [separate airfield technical maintenance battalion] an aviation technical base (ATB), while in other places they haven't made that much progress yet. But the times demand concrete actions. It has now been proven, after all, that to have a separate communications battalion and RTO [technical support company], a separate airfield technical support battalion, at an airfield is inefficient. They are largely redundant in their staffs. So the communications personnel, drawing allowances through the rear-support units, had their own chiefs of service: logistical support (the principal task of which was to perform an accounting and write requisitions to the *Obato* or the aviation technical units), trucking (also, at the slightest provocation, coming to the *Obato* with outstretched hands), aviation technical (without warehouses), and food (without mess halls) etc.

These specialists, with a high level of training on the whole, were engaged (and in some places continue to be engaged) in "expediting" requisitions for spare parts and repairs that the *obato* either did not want to satisfy, keeping their modest reserves for themselves, or could not satisfy, including due to a shortage of people. Even

though, if you look attentively, they were there. But it is difficult for many to look in unbiased fashion. We are all asking ourselves, are we ready to adopt energetically a system (albeit an efficient one) in which... there will be nowhere for yourself? I am sure that it is namely for that and other reasons, no less vital and simple, that many excellent innovations are not adopted. After all, there are airfields where a radio communications battalion, an RTO and an *obato* all live and thrive to this day, effectively not linked with each other, but performing the same mission.

We were one of the first in the air force to set about the assimilation of the new base flight-support system. Has it become any easier? No. Is there any work in aviation that does not require exertion anyway? But when we went "alone in the harness," it became much more efficient and purposeful to solve many problems.

Everything did not turn out as planned at once. Everyone knew where we had to start, but where to go and, most importantly, how to do it—there were no concepts. We had to raise the efficiency of utilization of material and human resources and work time and eliminate the constant rush work first of all. Haste and fuss, after all, are a true sign that disorder exists in the service organization and that the personnel are not suitably trained. And frankly speaking, when could they be? The duration and working regimen in the support regiments and units were not in good order. The rear specialists thus actually did not have enough time left to perform the inspections, the routine scheduled inspections of the equipment, perform preventive maintenance of the airfield and commander training.

That means that the organization of the activity of all subunits had to be set up first and foremost. Two technical companies were created in the *obato* after the appropriate study, which made it possible to support flight shifts by turns. This made it possible to reduce considerably the time that drivers of the equipment were at the airfield, straighten out their workday to a certain extent, smooth out their everyday life and relaxation and create conditions for training and education fairly quickly.

It became clear as the experiment proceeded that the ailments of personnel shortages and lack of materiel were having a negative effect on results. This was especially reflected in planning access to equipment for flights. The complexity herein was as follows. The commander of an aviation regiment, for example, is assigned the mission of supporting flights of 8-10 aircraft during the day and 18-20 at night. The night shift technical company is not able to handle that volume of operations. It has to be reinforced using specialists from the day shift. The set schedule has been broken and they are tormented for a while so as to "get back to the regimen." And as soon as they do, another disruption.

A fundamental decision was required. The specific nature of our airfield—which supports flights by various

types of aircraft, naturally creating additional difficulties—also impelled us to that. We thus arrived at the necessity of creating a powerful aviation technical base. It included two subunits—a separate battalion for airfield technical support and a separate communications and radio support battalion. This made it possible to cut back the administrative apparatus, concentrate manpower and equipment and achieve a higher-quality, rhythmical and efficient operation of the subunits and services. Everything is in their hands today. It became easier to maneuver manpower and equipment, allotting them to the most important areas. Whereas the communications personnel used to be forced to have dump trucks, excavators and cranes themselves so as to do their own “business,” today they are engaged in their own basic business, and the equipment has been transferred to the motor-transport companies. Requisitions for spare parts for us are allocated depending on the state of the equipment, and not on who it belongs to. The “construction” of the base has become more even and solid, there are fewer weak links.

The creation of the aviation technical base will make it possible to support flights by virtually any type of aircraft. This is, in my opinion, a promising direction in the development of the system of ground support for flights. There is no rushing the “commander’s” around during, say, drills or tactical air exercises to back-up and field airfields; there would be technical subunits already prepared for this. Our actions under such circumstances have been checked repeatedly and, bluntly speaking, produced results that we could not have achieved before. The quality of equipment servicing went up and, as a consequence, so did its reliability.

And another advantage of the ATB. It has taken shape historically that in aviation the senior officer of all and everything is the pilot. Everything, for example, is at the disposal of the regimental commander at the airfield. But is that good for the matter, or needed by him personally? This situation is justified when the discussion concerns issues not connected with exclusively technical aspects. And as for them, the whole authority and responsibility should be transferred to the appropriate specialists.

Today the commander of the aviation technical base is actually rid of subordination to the commander of the aviation regiment. Their mutual relations are structured to a greater extent on the requirements of the guiding documents. This allows the requirements themselves not to be ignored in the event of a lack of conformity to the extant circumstances, and the achievement of timely corrections and improvements. There are fewer conflicts, and issues are resolved with a regard for common interests.

Is everything fine now? When the first joy over the transition from a half-normal and half-beggarly state to rudimentary existence eased somewhat, we saw that we would not be able to get across the whole width of the chasm in a single leap. The aviation technical bases have

not yet become fortresses protecting the aviation regiments from certain misfortunes. First of all, in my opinion, due to the half-heartedness of the decisions in realizing the new structure.

Take, for example, the guarding and defense of the airfield. When television shows NATO military bases, as a professional I evaluate the organization of things there. Armored patrol vehicles, three-meter metal mesh instead of barbed wire, various types of communications and signals gear... We have aircraft hardstands as before, and the stores of fuels and aviation ordnance are guarded by soldiers armed only with standard-issue firearms.

We cannot equip our sentries in a way so as to ensure their security (helmets, light bulletproof vests) due to outmoded designs and norms, not to mention the lack of modern security gear that, I have heard, already exists, but it is unclear when it will reach us. And it is a very serious issue. Before the arrival of subunits from the ground forces, after all, we are to defend the airfield using our own manpower for the first few hours. One also cannot forget the attempts of conspirators to penetrate the guard accommodations and stores during peacetime.

No few problems also remained in the organization of protection for personnel against weapons of mass destruction. It is obvious that the position of chief of the service for the unit must be instituted, as exists in the aviation regiment.

It is quite difficult to organize physical training under our conditions, even though no one disputes the necessity of it. It is serious work, and an officer assigned to double it up with his own job cannot bring it up on enthusiasm alone. A person free for this purpose is needed.

The manning levels must be mentioned in particular. The solicitation of “slots” is not just cadging, not an attempt to provide oneself with an easy life and create excess manpower. It must be understood that the time for dilettantes has passed. Only a knowledgeable specialist answering for the area entrusted to him will be able organize matters as they should be, and not just for report. Imagine, by way of convincing you of what I am arguing, that someone proposed that the position of pilot be made non-staff and filled through doubling up on jobs. That person would be laughed at immediately. But the assignment of people to double up their responsibilities is considered normal for many jobs. Yes, the assimilation of an allied profession is essential, and I support it entirely, but the real denuding of key areas must end.

A lack of attention toward the personnel structure is a relapse of the old approach. Evidently not all officials of the corresponding subunits and services want, or are able, to look deeply into the essence of the proposed changes. And we ourselves were not so persistent as to convince them and prove to them the necessity of each staffing “slot.”

Representatives of the Air Forces Transport, Gas and Electrical Service headed by Major-General of Aviation Yu. Kolyaskin looked into the experiment best of all. The trucking technical-operations portion of the base increased by 60 percent, the appropriate categories of specialists were introduced and a quantity of equipment was added, which today allows the successful completion of the more difficult tasks.

Old, inflexible approaches to resolving many issues are restraining our progress as before. How, for example, can we bring directive documents into logical conformity with the demands of practice? Formalism inevitably creates a gap between them. Here is confirmation of that.

The chief technique for the special training of personnel is classroom sessions. And we go all out so as to observe that requirement for the sake of the "checkmark," even though everyone knows that our specialists learn the operations to support aviation units right at the airfield, in the course of practical work, every day. And the commanders are with us constantly, organizing that educational process. This is, in my opinion, far from the worst way. Perhaps it should be taken as the foundation, giving the course of combat training a more practical thrust?

It is better, of course, to deal with a specialist who has experience in the service, as well as knowledge. A commander, with such personnel, has more time for direct organizational work. Under the conditions of our region, rich in labor resources, we can man our staffing levels using hired specialists, while the conscript servicemen that come here should be sent to remote and northern regions, where the situation is even more difficult. A thing or two is being done here, it must be said, but unfortunately very carefully and too slowly. Some officers, by the way, are expressing their readiness to begin an experiment to staff positions in the driver corps and others entirely, or almost entirely, by hiring. That is, honestly speaking, to my liking as well.

And another thing. It is difficult to achieve a rhythmical supply of spare parts, and those that there are are more and more difficult to distribute. For the reason that everything is done without profound analysis of the state of the equipment. Time is wasted in finding and specifying information according to the office books, and that hinders the completion of measures. A far-flung information network should exist—by the way, obviously based on personal computers—to which all interested officials would have access. They have already had occasion to see such a system—a command station for the aviation technical unit linked with the network of the aviation regiment—at the Air Force Academy imeni Yu.A. Gagarin. When will it or a similar one come to the troops?

The chief result of the restructuring of our activity is that the ATB is living and functioning more and more successfully, even today providing an opportunity for raising the combat readiness of air units with a regard for

an increase in their maneuverability. But up to now a great deal of effort has gone into correspondence and proof of the necessity of this or that innovation, without which the best of intentions of the commanders of the aviation regiments cannot be realized.

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Combat Training Principles Found Wanting in Combat Aviation

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[Article by Lieutenant-Colonel A. Zhilin and Major A. Ziziko, combat pilot 1st class, under the rubric "Combat Training and Flight Safety—Point of Contact of Efforts": "The Gordian Knot of Problems in Military Aviation. Will a Sword of Damocles Be Found for It?"; conclusion—beginning in issue No. 9]

[Text] *We have considered two aspects, "aviation equipment" and "the human factor," in discussing the problems of lack professional protections for flight personnel (AVIATSIYA I KOSMONAVTIKA No. 9, 1990). But there is a third one that logically synthesizes the first and second, as it were. It is...*

3. The Principles of Combat Training

The principles of combat training are understood to mean the structure, procedure and sequence of the process of tactical air and command training in military aviation. The principal initial parameters here are the equipment, the human factor and, perhaps, the funds allocated for training. The principles of combat training, for their part, determine the ultimate results—the level of combat readiness against a background of flight safety, as well as the efficiency of funds expenditure and the time for the emergence of the combat pilot.

Several versions of the approach to the sequence of individual fighter training for the ability to wage aerial combat are used today (the discussion on the whole concerns aerobatic proficiency). It can be proven (and it must unfortunately be done even to the present day) that any sequence of training employed today does not lead to the desired result.

In speaking of the different approaches to flight training during the period of emergence of aviation, A. Markusha writes in his book "The Person Flying" that "Literally from the very first days of practical flights, two schools of flying schools took shape—one affirmed the principle of free maneuvering, referring to the experience of birds, while the other recommended beware of banking more than fire..." The history of world aviation has unequivocally shown the groundlessness of the views of adherents of the second school. Largely, we note, thanks namely to Russian pilots, first and foremost P. Nesterov and K. Artseulov. But unfortunately, it was namely the

second school (in essence) that began to be propagated here starting in the middle of the 1930s.

We turn to the history of domestic military aviation. V. Chkalov noted on 31 Oct 28 that "The trends that exist in the army toward maximum caution in flights are incorrect, especially in fighter aviation. The fighter pilot should be bold, in my opinion, with an unconditional lack of fear in flight. Otherwise a pilot accustomed to flying cautiously will be thinking more about the aircraft than the enemy in an aerial battle, as the result of which the enemy will undoubtedly shoot him down. This question is exceptionally important for the air force..."

On the eve of the Great Patriotic War, however, the cautious leadership of the air force (who had someone to be beware of!) cut off flights for expert-level advanced aerobatic maneuvers. The pilots had to pay in their own blood for this "concern" for them in the first period of the war. It would seem that the price of the oversimplified attitude toward the emergence of the principles of flight training had already been paid with the lives of many pilots, and a relapse will not be permitted in the future. This is, unfortunately, far from being the case. Combat training has once more been emasculating what is essential in combat since the end of the 1960s.

For example, the Course of Combat Training for fighter aviation—which defined the procedure for training fighter pilots until 1986—did not even include the concept of "expert-level advanced aerobatic maneuvers." The execution of even some advanced aerobatic maneuvers was forbidden using third-generation (!) fighters for a long time, while those that were permitted had stereotyped parameters. The structuring of military training in a creative manner was permitted on paper—every possible configuration was manufactured with calculations and graphs. But checking these ideas in practice, oh no! So it turned out that flight personnel were theoretically trained for what they had to execute in the air. But since the level of ground training was poor, the proficiency of the crews was also not high.

It is namely here, in my opinion, that the reason that leads to an error by this or that pilot when performing advanced training sorties is often concealed. Under such a restricted system, he simply proves unprepared for it. Clear proof of this is the catastrophe that occurred over neutral waters in the Baltic during the takeoff of alert aircraft to track a foreign aircraft. A fighter being controlled by a pilot with poor training in flying skills hit the surface of the water—not due to fire from the aircraft being tracked, but due to a stall in tracking it when the aircraft executed a series of advanced aerobatic maneuvers.

There is no opportunity to show the effects of all the principles for combat training on end results within the framework of this article, and a different aim is being pursued anyway. It seems much more important, using the example of one or a few principles, to answer not

only the question of what their incorrect composition is leading to, but also why they are being composed in that manner.

Everything proceeds comparatively well in the process of assimilation from the simple to the advanced, the more so if the maneuvers are executed carefully and according to form. But when a pilot hampered by restrictions, or possibly poorly trained, gets to flights at the edge of the allowable regimen or expert-level aerobatic maneuvering, the following occurs. Since "well-worn rails" are lacking, while the flight is being made in three-dimensional space, errors appear in flying technique that have already been discussed when considering the "human factor." Or else, when the quality of the "aircraft" link does not correspond to the objective requirements for safe functioning of the "pilot—aircraft" system, even strong pilots can commit breaches of safety in the process of the complete assimilation of an aircraft...

Representatives of the "beware" school, counting on attempts to raise flight safety instead of the fundamental solution of the problem (and effort must be expended for that), institute legal restrictions in the one case and the other that make it impossible for even a strong pilot to complete full-fledged training, since everyone here is trained, along with everything else, "at the same level."

Here is the next objectively existing component of the lack of protections for the combat pilot. The aircraft among the troops continue to have design and production flaws. Conditions for the flourishing of grayness and lack of talent appear in peacetime flying, aside from everything else. It is long since time to admit that the existing system is figured for mediocrity and has, for many years now (since the time of Stalin), actively reproduced it. The command of the air regiment in which one of the authors of these lines served brought to life a policy of maximum cautiousness and simplification in flights in parallel with the general trends and directions of combat training in the air force. These "careful warriors" for safety, after having passed examinations for combat competence at airfield X, organized the collection of money (so much per pilot) to "raise the score." The process of "augmenting" professional skills, naturally, occurred behind closed doors.

The regiment left for home with a grade of "B." They flew off having deceived the people who look on their aerial shield with trust. The pilots also deceived themselves, since their proficiency corresponded to a C at best. The commander, on the other hand, got his next promotion and, in the words of former fellow servicemen, is prospering even today.

It is offensive and painful to say, but the false zealots of accident-free operations try to treat the aspirations of the warriors of the air to become such through the complete assimilation of the whole range of aviation skills, thereby

ensuring flight safety (which, by the way, is a manifestation of the instinct for self-preservation), as a way of reducing flight safety. And they are largely succeeding in that.

The relay race of the fight against incompetence and ignorance, laziness of intellect and criminal official inertia in the composition of the principles of flight work that started with the birth of aviation and has been carried throughout the history of its existence by Nesterov, Artseulov, Chkalov and other less well known but true professionals continues even today. It is sounded in the open letter of combat pilot Sysoyev to the air force commander-in-chief in the pages of KRASNAYA ZVEZDA in 1987. In the words of civilian helicopter pilot Ye. Alkov, an innovative designer, in the pages of IZVESTIYA on 2 Feb 88: "It is strange that we have so much but can do nothing. What strength does this invisible layer possess, this secret front of the 'play-it-safe' people, that we cannot defeat? And why can't we? Why do we take their 'not allowed' as the last word? Why do we stand at attention knowing full well that it is we, not they, who are right? Why do we say the creativity of the masses, boldness, experiment everywhere, and do the opposite? Why, over all thirty years of work in aviation, have they asked only obedience of me? No one has needed either my techniques or my risk, my ability to feel the helicopter with every cell and every nerve of my body? Why do they trample us?"

The answer is quite simple. On the whole, just because we are completely without rights and absolutely defenseless against official dictate (please do not confuse dictate with the concept of healthy sole responsibility!)

Take, for example, the principles according to which the actions of a pilot connected with accidents and the precursor conditions to them are analyzed. Everything in their compilation should be subordinate finally to obtaining the true cause of the accidents or preconditions. Otherwise, after all, any measures to avert a relapse will not produce the necessary results. National aviation in the United States, for example, started a system of voluntary reporting back in 1976 for this purpose, where reports from pilots and other aviation specialists regarding errors made are gathered anonymously. Joint analysis of that information by the representatives of such sciences as ergonomics, psychology, physiology, aviation medicine and decision-making theory, among others, makes it possible to determine the true causes of errors and develop the proper recommendations and measures aimed at averting similar deviations, so fraught with danger.

Commanders and senior officers in military aviation here—who, on the one hand, cannot be competent on all issues and, on the other hand, including by virtue of their own official positions, bear virtually no responsibility to the pilot for the objectivity of their decisions—determine the cause of the preconditions or the accident itself, as a rule. This provides an opportunity for some officials to conceal their own shortcomings, hiding

behind the "error" of the pilot. Even here the pilot, as we see, is in no way protected against subjective administrative whim.

The constituent elements of the lack of protections for military pilots presented above, hypothetically divided into three groups or aspects, on the whole cover the professional aspect of the overall problem. There is another, no less important aspect of the issue—the social one, which has a negative effect on the overall state of affairs to a considerable extent. This is a subject for another discussion, however.

We think it is clear from the aforementioned that the lack of protections for the profession of military pilot, along with the enormous and sometimes simply irreversible personal harm to him, is significantly detrimental to the combat readiness of the armed forces of the USSR and flight safety. This runs over into large material and moral losses. The confluence of the personal interests of the pilots with public interests, by the way, is distinctly visible here.

How can the problem of protections for the flight personnel of military aviation be solved relatively quickly and cheaply with a large guarantee of success? The answer to that question lies at the heart of the conceptual guidelines for the realization of the nationwide tasks indicated by the CPSU, our government and the USSR armed forces command. They are, first and foremost, making the human factor (in the broadest sense of the word) more active. "The inclusion of each soldier in the common cause," emphasizes Minister of Defense and Marshal of the Soviet Union D. Yazov, "is, ultimately, the human factor in action. Making it more active is the task of tasks in restructuring the armed forces, as it is in all of our society. Its solution depends on many conditions. One of the most important of them is attention to the person in the military uniform, fulfilling his sacred duty to defend the Fatherland."

We see as one of the main directions for making the flight personnel of military aviation more active—by virtue of the clearly pronounced and specific nature of the profession—the creation of an association that would unite, and rise up to defend the interests of, the fliers in the armed forces of the USSR and military test pilots, as well as those who have left flight work for various reasons.

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Roundtable Discusses System Drawbacks in Aircraft Servicing

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pp 14-15

[Roundtable discussion by aviation officers under the rubric "Combat Training—Problems of IAS [Aviation Engineering Service]": "The System Needs a System"]

[Text] *The regiments of front-line aviation have converted to the servicing of aircraft using servicing and maintenance crews and are already living according to the new staffing levels. They are seemingly working in a new manner, but the assimilation of the system sometimes proceeds with difficulty, with failures disrupting the rhythm of preparing aircraft for flights. It undoubtedly has many proponents, but there are adversaries as well. The disputes on ways of improving aviation engineering support are not subsiding. Perhaps it is not a matter of the system alone?*

The difficulties the fliers of the Transbaykal Military District have encountered in incorporating the system were related in an article by Capt V. Mayorov entitled "To the Ground. What For?" (AVIATSIYA I KOSMONAVTIKA No. 9, 1990). Some interesting proposals, in our opinion, were expressed in it. That discussion was continued by the participants in a roundtable conducted by the editors in one of the air regiments of the Moscow Military District. They agreed with the author of the article on some things, and objected to others. Only that way can the truth be revealed.

Major O. Kucherenko, deputy commander of a squadron, commander of an aviation technical detachment: Formalism "ate up" the last system. It is no way to do it when the quality of the fulfillment of operations came to be checked by actually flying, since it was realistically far from possible to check everything. You got sick, of course, of deceiving oneself and others. The new system is not bad overall, it is interestingly conceived, but it has not been carried through to the end. Its core is a good knowledge of related fields by the technical personnel, and that is a very complicated matter, an enormous training, physical and psychological burden on the person.

What baggage did we bring with us as we switched trains? I agree with the opinion of Capt V. Mayorov that we actually have no experience in mastering related fields, and the level of training of many fliers leaves much to be desired on the whole. "Narrow" specialists are coming out of the service schools with only a general conception of the new system, and there is effectively no time and no place for us to complete their training.

As long as I have served, I have been asking one and the same question at the final inspections and inspector interview sessions: when will we have squadron lounge shacks suitable for work, training and relaxation? Everyone writes, issues are summarized, replies are probably prepared. But we are still teaching in the "classroom" that I, as a lieutenant, and some colleagues built out of old ammunition boxes that we begged from the *obato* [airfield technical maintenance battalion], with beams and joists from a ruined house we found in the woods. Can we teach engineering under those conditions, with such a poor physical training plant?

If you ask anyone whether they would agree to have their duties and responsibilities doubled while their pay

increases by just five rubles, it would be interesting to see how many would give their OK. The former TECh [technical maintenance units] chiefs of the flights are not in any hurry to occupy the post of crew chiefs—taking on all the additional routings, getting a couple of dozen people subordinate to them and answering for the material assets assigned to the crew—for an extra five rubles. And the crew chief, after all, is the key figure in the system.

Captain V. Nikolayev, crew chief: I have heard that the crew, in the creation of the system, was conceived to be like a tank crew, able to fulfill all of the assigned tasks in autonomous fashion. But would a tank go into battle, for example, without a driver/mechanic? We are short of people—a common and, it could be said, accustomed affair. I see the cause of the failures—like the author of the article "To the Ground. What For?"—namely in this understaffing. We will be unable to achieve qualitative changes without solution of the problem of quantity. Each should be in his place and know his business.

The crew has all specialties in principle, but it is an enormous distance from the staffing level structure to the collective. I do not agree with the author of the article that no one has an interest in training people. No, I—a crew chief—am very interested both in the training and education of the people and in the organization of the work. Once in for a penny, after all... But give me the opportunity! The crew chief must be granted the right to provide incentives for peoples' work somehow. I understand that it is still difficult to find the money for this. Can the specialists then perhaps be stimulated with free time? You are done, you have studied, so go home to the family. Is it correct to keep them at the airfield for the greater portion of the time? It is worse for a tired person both to study and to work.

As for related fields—I am in favor of the outstanding mastery of one's own assigned field first! A person needs something to be proud of, he should know something better than others. Then he is somebody, a master! If an orchestra has virtuosi, it can perform any works. They play the whole part. But people should be as permanent as possible, in one place, the orchestra should get used to playing together. So the "filling of slots," then, difficult as it may be, is only the initial stage. If people do not grow and realize their potential, it can happen that in time only "drums" will remain in our orchestra. And that is another tune entirely...

I repeat, give me the opportunity of actually being a chief. I should, after all, not only demand the irreproachable fulfillment of official duties from my subordinates, but also be concerned for them. And I cannot give them what I should. And it is morally difficult for me because I, like them, do not have the conditions to wash and get warm in the winter. When I go home on the bus, I hide my greasy hands. I am ashamed. And why aren't those who have not created the rudiments for us also ashamed?

Captain A. Vinogradov, engineer in an aviation technical detachment for aviation equipment: It is possible to work under the new system, but it must be backed up, of course. Good airfield equipment is needed, otherwise the labor can go for nothing, for the performance of operations that could be mechanized or automated. We are also agitated by the late deliveries of assemblies to replace failed ones. Sometimes an aircraft stands idle for more than a month due to lack of spare parts. And this makes the maneuvering of equipment more difficult both for us and for the commanders. The system should operate "like clockwork." There are no petty details in it, and everyone should understand that. What relation, for example, does the quality of our work clothing have on personnel staffing? A direct and immediate one! A specialist in an unsightly, heavy and uncomfortable uniform gradually loses respect for himself, becomes indifferent. Let those who are occupied with our uniform also know that they are also to blame for the situation that has taken shape. And not they alone. Everyone, everyone must urgently review and evaluate in a new way: what is hindering us from fulfilling our duties as they should be?

Particular attention, in my opinion, must be devoted to clarifying the role and duties of engineers at all levels in today's situation. Who are they today? What should they do, and what not? Aren't we losing them, making some of them errand boys and others pure administrators? It seems to me that AVIATSIYA I KOSMONAVTIKA should also be involved in the solution of this, I am convinced, most important problem.

Captain S. Potapkin, engineer of an aviation technical detachment for the sighting and navigational systems: Who am I today? A commander without an army? A repairman? It was stated correctly in the article "To the Ground. What For?" that we can lose PNK specialists. And the results of combat application, after all, depend largely on them. A bomb or missile strike is intrinsically what the aviation system exists for. And PNK specialists are manifestly lacking in the teams. A PNK engineer, of course, can also monitor and repair, but this inevitably affects the training of people, the processing of statistics on combat application, analysis of the operational fitness of each system—that is, preventive maintenance. And we will constantly be "patching holes" if we do not set up the preventive maintenance of failures and flaws. If we set up the routings as envisaged in the system, then we also need to adopt certain measures so as not to lose the PNK specialists, not lose them among other specialists.

Senior Lieutenant A. Belokon, senior crew technician for radio equipment: The system has been officially ordered adopted for almost a year now, but things are still proceeding grudgingly. There is simply no time to study and assimilate allied fields under conditions of intensive flights and an inadequate number of people working directly on the equipment. And there are no incentives for assimilating them anyway. I want to believe that the institution of pay for skill grades will help. But will a

master really be a master? We probably need to pay first for mastery of one's own field, and then for a second, for related ones.

There are also shortcomings in the technical literature for aircraft preparation. While the literature for combat trainers has been worked out well—who has to do what under the new system is clearly indicated—there is a great deal of vagueness in the technology for servicing combat aircraft.

Captain Yu. Sinitsyn, aircraft technician: My opinion is that if all the responsibility is divided up, as is inherent in the system, it is possible to work. But if not? The technician on the crew, of course, is a special figure, the "director of the aircraft," as they say—he answers for a great deal, but if attempts are made again, as they were under the old system, to dump all the responsibility for the preparation of the aircraft on him, formalism will result again and we will return to where we came from.

I have been servicing aircraft for many years, and I have mastered my field pretty well. But what are the young technicians like? It is hard for me to fulfill all of my basic work, since the mechanic who should be working on the routing relegated to him is hardly ever at the airfield. And it is also difficult to monitor the fulfillment of operations by other specialists. There is not enough time or knowledge. Perhaps I am psychologically still an "old" aircraft technician.

If the aircraft technicians are not working, the system won't work either. And it was and remains a non-prestigious field. The pay is the same as for technicians in other fields, but the volume of work and the responsibilities are substantially higher. Oh, how we cling to pay leveling! It has now been condemned in the highest forums—at congresses, at sessions—while the financial bodies are not changing the old methods at all. If the pay cannot be differentiated for some reason, then a bonus system could probably be instituted. The contribution of each specialist to supporting the flights should be taken into account therein. Isn't the author of "To the Ground. What For?" correct when he calls debatable the suggestion to pay people permanent overtime? There's nothing to argue over there! An incentive system must be instituted at once: strong, flexible and with a broad spectrum of compensations, with the granting of the right to provide incentives (and punishments), using the ruble, to all supervisors. Otherwise, how can they be supervisors?

Lieutenant-Colonel S. Bocharov, deputy regimental commander for engineering and aviation service: The system is more flexible than the old one in principle. It is easier to execute a redeployment or support tactical air exercises. Whereas it used to be very difficult to assemble a "team" for this work, now the task is accomplished more simply. The crew has permanent people and its own matériel, and can be redeployed as a whole to a forward airfield to perform all types of aircraft preparation. There is already experience in working at several airfields. It must be analyzed and consolidated.

It is also important to provide more opportunities for the selection of worthy candidates for the post of crew chief. Life has shown that they can be a professionally trained officer and educator possessing organizational abilities.

The requirements posed toward supervisors of various ranks, including the lower echelons, will increase sharply under the new system. When officers head up collectives, they have to assimilate the planning of operations and the distribution of the personnel, but they have few leadership skills. We have no clearly defined system of training people for the execution of higher positions, we throw them right in, as it were, and then whip those who can't handle it. Can they really have gone from good to bad right away? They are energetically beginning to train managers across the whole country, understanding that this is a question of the life of the organization. We must make active use of these methods, and increase sharply our attention toward the assimilation of management science. AVIATSIYA I KOSMONAVTIKA, by the way, could be of great help in this by publishing rules for the work of the supervisor. People, after all, do not know rudimentary things and are making mistakes every day without understanding why things are not working out...

Much has to be changed in training, we must seek out more efficient methods, for example the method of strongpoints, and improve the physical plant for training considerably. The psychology of people can be restructured on the basis of firm knowledge, we can see that they do not fear related fields.

Much in the assimilation of the system also depends on qualitative changes in the working conditions at the airfields. Things would get easier, for example, with the introduction of a centralized refueling system—the aircraft need not be rolled to the TsZ by hand. The level of mechanization, however, is too low overall. Mutual aid and mutual assistance should help us, of course, and that, strictly speaking, is inherent in the system. We did not divide up by fields and jobs in Afghanistan, after all. But having *"tout le monde"* dragging around and hanging bombs and missiles is, I hope, a temporary measure caused by a shortage of equipment. When will something better than the PT-500 cart—which itself weighs 300 kilograms and is not very convenient—appear to equip the weapons people? Built-in monitoring and information-display systems are also needed.

There is thus still much work to be done on the system for operating aviation equipment. One cannot feel in any case that we have done the main thing, since the person, as they say, has not yet been put at the focus. We do not see the person, we do not have the time. Or we cannot? Or we do not want to?

Colonel N. Rozhkov, commander of the air regiment: A transitional period is always hard. But people have accepted the system overall, and the first results already exist in increasing aircraft flying time and supporting

exercises, although it is still too soon to speak of its complete adoption. Too many obstacles have to be overcome.

The fact that each should be engaged in his own work is correct in the system. Let us thus codify that into law, look attentively at the structure of the regiments and their function and bring them into complete conformity with each other. The legality of the functioning of a military unit and each flier should be not only declared, but assured. In everything—in the large and in the small.

Why have we been put into the position of perpetual "yes-men?" Everyone knows, after all, how hard things are for us in construction, repair, private subsidiary farming and much more that is so essential but not taken into account in the staffing requirements for the work. The job of squadron clerk has not been provided for, people are also needed for repacking the parachutes and emergency supplies in the airborne assault service, or the servicing of high-altitude equipment. Someone should provide for the around-the-clock operation of the classified department, clean up at headquarters at the sports facilities... That is why people are often counted as being in a job at one place, but are actually engaged in work at another.

The direction of concern for the person that has been taken is quite correct today. No system can work without people. But it is becoming more and more difficult to attract them and keep them in the army. It is time to create a streamlined system of concern for the fliers, providing them with the conditions for living and working. It should also include the accelerated construction of housing and social and cultural facilities, the improvement of aircraft equipment, the organizational structure and much more.

Only with that approach will we be able to raise the prestige of our profession, get rid of the notorious chronic understaffing and help people believe in themselves and in restructuring.

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Conversion Diluting Aircraft Development Efforts at Design Bureaus

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[Article by A. Zhiltsov: "A Version of Aviation Conversion"]

[Text] *Perhaps because we have a "wooden" ruble, we are making cutting boards at aviation plants instead of aircraft? There is no need to argue whether a transition from the production of weaponry to the creation of consumer goods is needed. The question can only be in what proportion to do it so as to have the opportunity of*

protecting what is created by the people. I think it is high time to discuss what to turn into what, the ways of conversion...

It is still not too late, there are still people who know how to make aircraft.

"When will we stop killing the goose that lays the golden eggs? Now many are getting mad and even saying that we are practically against conversion. No and no again!" says the deputy general designer of the OKB [Special Design Bureau] imeni Ilyushin, V. Terentyev. "We are against poorly thought-out conversion. It seems to me that each should be engaged in his business that he learned, in which he knows what he is talking about, anyway. We, for instance, have been entrusted with the design of an automatic device for stretching and drying leather. And the deadline we have been assigned is ludicrous—six months! And we have to have a complete understanding of all physical and chemical processes, as we are accustomed to aviation. They are not giving us either the appropriate equipment or the money either. The very same 'whatever's-left-over' principle that ruined light industry is in action here. And then, if you take conversion the way it is understood—a transition from a military to a civilian track—then there is virtually nothing here to convert anyway; we are a civilian enterprise, on the whole, and virtually all of the projects here are civilian. So why should we replace civilian products in our field with others that are not? Aren't there any problems with aircraft in the country? Aren't airline tickets a consumer good? Aeroflot has an old and worn-out aircraft fleet! And we could obtain hard currency by selling aircraft. One airbus, by way of example, could be replaced with several lines to produce whatever you want, including equipment for drying and stretching leather."

Very little time remains until the entry of the Il-114 and the Il-96-300 into service, and others are on the way.

The Il-114, for example, is designed to operate on short-haul routes that have been flown for decades now by the Il-14 aircraft, along with the An-24 aircraft that is at the limit of its operational life. It will be able to deliver 60 passengers a distance of 1,000 km at a cruising speed of 500 km/hr. The aircraft has a ceiling of 8,100 meters. The use of two highly efficient TV-117 engines with a power of 2,500 hp each with low-noise six-bladed propellers, according to calculations, will make it possible to expend just 18.9 grams of fuel per passenger-kilometer. An auxiliary power plant provides for the opportunity of autonomous operation, which reduces sharply the requirements for airport equipment. It will also be able to operate from dirt runways. It is designed for 30 years of service, 30,000 of total flying time and 30,000 takeoffs and landings. It can be stated with confidence that the Il-114 will be the principal aircraft on short-haul lines in the first half of the next century.

Five variations are being developed on the basis of the principal version of the Il-114: an Arctic version, fishing

reconnaissance, photocartography, convertible (cargo/passenger) and a passenger version with a stretched fuselage. A downsized version close in size to the well-known Il-14 is being studied, and has received the designation Il-112.

The Il-96-300 is a long-haul airbus for high-traffic passenger routes, able to deliver 300 people a distance of up to 9,000 kilometers. The aircraft, corresponding to all contemporary and very strict world requirements, will be able not only to satisfy the requirements of the population of this country, but will also bring in hard-currency profits—according to the firm of Boeing, the requirements of the world market for aircraft of this type will be on the order of 10,000 aircraft by the year 2005. If we are able to get the plane to market in time, the state will be able to obtain up to an additional billion dollars of net profits.

Work is already underway on modifying the aircraft. An increase in range is being studied through increasing the amount of fuel, and then installing more powerful and economical engines. The lengthening of the fuselage will make it possible to bring the number of passengers to 400. The installation of two more powerful and economical engines in place of today's four will make it possible to reduce fuel consumption to 17.5 grams per passenger-kilometer. The fuel consumption of the Il-86, by way of comparison, is 34 grams per passenger-kilometer.

Work is continuing on the Il-76, based on which an ocean rescue aircraft has been created that is able to detect the stricken and drop a rescue boat, as well as a firefighting aircraft that has no analogue in carrying capacity. Requests for its use have already come in from a host of countries—there is no more effective method of fighting forest fires.

Work is also being conducted on the well-known Il-86 airbus with the aim of increasing its economy and flight range to 6,000 kilometers.

The Il-108 administrative jet aircraft, for 9-15 passengers depending on the version used, is being studied for the flights of business delegations on medium-haul lines. It can cover 4,850 kilometers with maximum loading at an altitude of 12,000 meters at a cruising speed of 800 km/hr. Our industry has not yet put out aircraft with such parameters. The An-24, Yak-40 and Tu-134, not to mention the Il-62M, that are used to deliver various delegations today "eat up" several times more scarce fuel than the Il-108.

Here is the opinion of the chief designer of the OKB imeni A.S. Yakovlev, A. Dondukov: "Today roughly 12 percent of the work we are engaged in is not connected with aviation. We are losing time and the skills of people. Specialists who have dedicated their whole lives to aviation cannot design and develop can stackers and automated devices for the packaging of dried milk with the same enthusiasm (and after all, it is namely there that everything is largely being held up)! I think that an attempt to solve consumer-goods problems at the

expense of the 'rich aircraft builders' is an example of our oft-condemned but still surviving willfulness. Money has to be invested in aircraft construction—test jigs, tooling, testing equipment. Aircraft must be made quickly, while there is still a demand for our aviation equipment abroad. Capital investments in aviation—if, of course, it is understood to mean namely the building of aircraft—is tens of times more efficient than the production of products outside of our field. Everyone, after all, needs our aircraft. And we can give them to them if the funds freed up from the curtailment of work on military aviation don't go just anywhere, but to the development of civil aviation. Only thus. If nothing is invested, nothing is obtained. And not because we are so capricious. These are ordinary economic laws that the planning bodies are still ignoring, by habit putting their trust in 'economical economics.' We have appealed to every office, but everywhere a 'padded wall'...

"The aircraft they are waiting for already exist. We must only help them 'be born.'"

A new passenger aircraft for local routes, a novel kind of flying taxi, is being created at the OKB imeni A.S. Yakovlev—the Yak-112. The top speed is 300 km/hr, ceiling is 4,000 meters, range with four passengers is up to 500 km, and up to 1,000 km with two passengers. The takeoff weight is about a ton, the takeoff run is 200 meters on concrete or 300 meters on dirt, and the landing run is no more than 200 meters. We having nothing analogous to the Yak-112. There are not enough aircraft in this class abroad either. The market is enormous. The firm already has orders from foreign companies for more than 500 such aircraft. Work on the creation of this aircraft was organized in non-traditional fashion. The financing was accomplished by the Moscow Association for Economic Collaboration with Foreign Countries, the development of the pilot's and navigator's systems by the Soviet-Swiss enterprises of ASCAD, and the series production by the Irkutsk Aircraft Plant.

Work is also underway on the very promising Yak-58 aircraft. The aircraft, whose takeoff weight is about two tons, will be able to deliver six passengers a distance of 1,000 kilometers, with fuel reserves for another 45 minutes of flight. The Yak-58 can be used as a business aircraft on an intra-oblast scale, as well as a passenger aircraft on local air routes or as an air taxi. There are no such aircraft in the USSR as yet.

Work is beginning on a jet-powered "businessman's aircraft" able to deliver six to ten people a distance of up to 5,000 kilometers at a speed of about 900 km/hr.

The Yak-42M aircraft is also being developed. Its predecessor, the Yak-42, was far from being the worst in that class of aircraft in economy, noise level and ecological cleanliness, but the modifications will improve the aircraft's parameters to an even greater extent. New navigational equipment and wings will be supplied, and the length of the fuselage is being increased by five meters, thanks to which the passenger capacity will rise from 120

to 156-164 people. The more powerful and economical D-436 engines will be supplied in place of the D-36, through which the flight range of the aircraft will increase to 2,500 km.

If everything goes according to plan, the series production of the Yak-42M will begin in 1995, and 200 aircraft will be built by the year 2000.

The Yak-46 aircraft is a further development of the Yak-42M airliner. Its chief distinction is a fundamentally new power plant—two improved propfan engines in place of the current three turbofans. The fuel consumption will be just 14 grams per passenger-kilometer thanks to these highly economical engines.

An unusual fate lies in store for the widely known and largely unique Yak-40 aircraft. It has now long been considered functionally obsolete, but great demand has now appeared in the West for aircraft of this type that our industry is largely able to satisfy. There are orders for it, and the production capacity exists as well. The holdup is the engines, since the regular ones do not conform to a number of world standards. If this issue is resolved, a second life for the aircraft and, judging by everything, some profits are assured. It must only be kept within the five-year period while we have no competitors.

Projects traditional to the OKBs are also underway in the realm of recreational aircraft. The Yak-55M will begin coming off the assembly line as of the start of next year, and the Yak-56 and Yak-57 are being planned.

Two advanced aerobatic aircraft—the two-seat Yak-56 and the single-seat Yak-57—are further developments of the Yak-55M. They have light weight (850 and 650 kg respectively) and high speeds, up to 450 km/hr. The ferry range is 700 km, with G-factor limits of +9 to -7. It is being proposed to fit the Yak-55M with the M-16 engine with a four-bladed propeller and a power of 300 hp. The aircraft will correspond to the highest world requirements posed for aircraft in this class. There are already orders for the Yak-55M, and with access to more contemporary ones the number of customers, and the hard-currency receipts for the country's economy accordingly, should increase sharply.

The design collectives have great plans. But we cannot tell you about all of them yet—though is far from being a matter of military secrecy, but rather one up to know unknown to us—business secrecy. Competition is competition.

It is a pity only that virtually all of the equipment of tomorrow is being created not thanks to conversion, but rather despite it, as it were. It is not in search of the easy life that the aircraft builders are asking that the uncharacteristic obligations be lifted from them. They are simply accustomed to thinking, seeking and finding the optimal versions for the resolution of tasks, in this case the provision of consumer goods to the population.

Aviation has come to the aid of the country many times, providing it with the opportunity of peaceably building the future. It will come to the aid again this time if it is not itself destroyed, if the potential that has been created over the decades is not squandered irrationally; matters are still unfortunately proceeding in just that direction.

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Career Prospects Discourage Junior Officer Technicians

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p 19

[Article by Captain V. Batyr, deputy of the city soviet, under the rubric "Facing the Problem": "How Are You Getting On, Lieutenant?"]

[Text] I recently had occasion to talk with a young officer—an aircraft technician. How, I asked him, are you getting on, lieutenant? He told me this: he saw no future in the service, he and his wife were fed up with the everyday hassles, material want, dispirited by a feeling of his own secondariness. Overall, he was ready to quit the army. His wife was trying to convince him to return to his native region, where there was a house with a subsidiary plot, and a farm promising well-paid work.

Frankly speaking, I was not surprised by what I heard, since the discharge of young officers from the army at their own request or as punishment has become quite widespread. Seven were discharged in our regiment recently, for example, basically from among the technical personnel.

What is the reason pushing people to take this step?

Graduates of the military aviation technical schools come into the regiment every year. They are well met here. Senior officers V. Baranovskiy, N. Butakov, P. Bormotov and others help the novices master their fields and merge with the collective. Diligence and integrity are encouraged. This undoubtedly has a positive effect on the emergence of the young officer technicians.

But there are other factors under the influence of which their business and moral qualities and psychological mindset take shape. They often prove to be decisive.

The graduates of the aviation technical schools, as a rule, are full of hopes for a good career and are ready to pay for it with conscientious service. They are energetic, charged for self-development and, I would, say, are head and shoulders above many of their compatriots in civilian life in their understanding of honor, respectability and responsibility for matters entrusted to them.

Meanwhile the aviation technical service, as they say, is not all roses. Take, as an example, the usual work week typical of the unit—two flight shifts of 13 hours each, plus two days of preliminary preparation. To that should be added time to correct defects and failures. The

inspection and maintenance day also requires no little effort, especially in winter. The snow is cleared most often using shovels, since the snowblowers are either out of order or needed somewhere else. You cannot speak of a fixed work day or week overall. Rain and snow, cold and intense heat are also not allies of the aviation engineering specialist.

Various housekeeping chores also pour onto the technician as from a horn of plenty, both on the official territory and in the residential zone.

In the crew the technician is a specialist, so to speak, in a broad field. He knows the engine, the aviation equipment and the radio equipment. And not only knows it, but knows how to work with it, and gives a guarantee of reliability. I think there is no need to speak of the responsibility that lies on him.

And in the servicing groups? There are usually two or three people in them instead of the five according to staffing requirements. The operations they have to perform are scheduled for five people. That means that each of them is taking on additional work and additional responsibility. The monetary sustenance meanwhile remains unchanged, and the officer receives no pay supplements for "that guy" who is not on his staff.

They complete two or three years of service. A third star appears on their epaulets, but it adds no optimism since, as many are able to convince me, this rise in rank can prove to be the last. The officer sees that his further advancement is limited, the prospects for training at the academy are not as accessible as they were presented to him by the instructors at the school—this one does not have enough years of service, that one has no orders, preference is given to someone else, or the commanders hold them back—we have no people, they say, you have to serve here. There are also virtually no routes to civilian higher educational institutions either. And so somebody cools in his work, loses the guiding core of life, and falls into the ranks of the people toward which the commanders usually have a guarded attitude. Others, in their search for advancement and a way out of the dead end, try to flee engineering to any other services or, for example, to transfer to Komsomol or club work. Those who cannot manage it start thinking, is it worth serving any more? Willingly or unwillingly they begin to compare themselves to a civilian specialist. The law codifies for the latter the right to training and relaxation, pay for overtime work and substitute service or doubling up on jobs.

By the way, can a technician receive much? His monthly income, as they assert, differs little from the weekly wages of an honest cooperative worker. It must also be taken into account that a young officer has a wife, as a rule, who is not working, since she has to be occupied with a child. They can only dream of kindergartens and nurseries in most garrisons.

And right alongside, beyond the gates of the military town, there are nurseries, a kindergarten, a Pioneer

camp, a rest home and other social benefits at the service of workers, office personnel and the members of their families at civilian enterprises in accordance with the labor contract.

It is happiness if a young family has its own nook. But many have to rent a room. Wherein the private sector, knowing very well that servicemen now receive a certain allowance and compensation for rented housing, have increased its price considerably. So fork it over, lieutenant.

The situation is no better for bachelors. A small room for three in an officers' dormitory awaits them, where hot water, dryer, kitchen and furnishings for the recreation room seem an impossible dream.

I want to say for the sake of fairness that the problem of housing at our garrison is not as acute as at many others. But the principle of housing distribution in effect is that it is provided first to flight personnel, individuals who completed service in Afghanistan etc. A young technician who does not have these privileges waits his turn for two or three years at best. He moreover does not receive an apartment in a new building, but in one that is roughly 60 years old, decrepit, damp and with broken heating and sewage systems.

The problems of sufficiency, social equity, social protections, prestige and guarantees of civil rights pertain to more than officer/technicians alone, of course; they are typical of our officer corps in general. But this category of servicemen is the weakest link in the overall chain.

The unit commanders undoubtedly cannot alter the situation in any substantial way. Other scales and other approaches are needed here, I think. And first and foremost solution of the problem of the whole institution of army service and its professionalization.

The following could be provided for, I think, in military reform: each serviceman concludes a contract for several years, say initially for five years, so as to "work off" the funds that were spent on his training. The agreement should discuss the mutual rights and obligations of the commanders and the officer corps. Interest could be shown, for example, in guaranteeing the right to training at civilian higher educational institutions for the graduates of aviation technical schools. The principle here is the same—if the state wants to have a reliable, combat-ready army, it should be concerned with its key personnel.

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Ultralight Aircraft Pose National Security Risks
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pp 20-21

[Article by V. Ilin: "Superlight Aircraft and Weighty Problems"]

[Text] Rust, Schneider and... Others

More than three years have passed since Rust, having covered half the way "from the Varangians to the Greeks," landed in Red Square, but the alarm over the protection of the air boundaries of the Motherland has not left either the military, called upon to ensure it, or civilians. The more so as on June 9 of this year, the West German pilot Schneider landed at the Batumi airport, left a "gift" on the runway and took off without hindrance. Naturally, neither Rust nor his successor posed any threat to the security of our country. Other unsanctioned "international flights," however, could look quite different, since today superlight aircraft, judging by the reports of the foreign press, have taken on new and far from always sporting qualities. And in a certain sense we could even be grateful to Rust and Schneider for warning us of the vulnerability of our air borders.

It was felt for many years that the fight against the shipment of drugs and contraband by air and terrorism were problems far from us. But they are not new for other countries, and are exceedingly alarming. The use of light-motor aviation by various armed organizations poses no less—if not more—danger. The accessibility and relatively low cost of the ultralight airframes [ULA] is facilitating this. The firms selling these ULAs through a multitude of agents often do not even think about whose hands their products will ultimately end up in.

The purpose of their application is varied, but the methods are largely similar. According to the journal JANES DEFENCE WEEKLY, some Palestinian organizations have created their own armed forces, consisting of ultralight aircraft and intended for the execution of sabotage operations. They rehearsed the concepts for the use of ULAs as a means of light transport and carrying of weaponry for actions against Israelis in the 1980s. The first attempt to use "ultralights" was made in March of 1981. Two aircraft with fighters and armed with bombs and grenades took off from Lebanon and tried to attack a petroleum refinery in the Israeli city of Haifa. They lost their way, however, and were captured.

The features of the ULAs initially used did not satisfy the Palestinians. But with the aid of their advocates in Europe, a representative of the supreme command of the Popular Front for the Liberation of Palestine, A. Jibrail, brought in specialists from the West German firm of Schweitzer to modify the aircraft, aimed at strengthening the structure, increasing the power of the engine and improving airborne navigational equipment. The upgraded ULAs were used by the Palestinians on 25 Nov 87 for a raid in the area of the Kiryat Schmon. Four craft took part in the raid; one returned to the base due to technical problems, two crashed in flight and one made a forced landing near an Israeli army base. Palestinian groups had achieved a high level of combat readiness by 1989. They practiced new methods of employing superlight aircraft, since "ultralights" had appeared—both piloted and non-piloted "flying bombs."

The ULAs could also be used as light ground-attack aircraft with the hanging of non-guided or guided air-to-surface missiles, bombs and firearms mounts. Test firings of missiles from the Baruders from Zenith Aviation were conducted in France in 1985. The process of technical improvements in ULAs is continuing as well. The British Lascombe Rattler P-3, developed allowing for use for military purposes, has a range of 1,100 km and is able to stay aloft for 11-12 hours with a maximum takeoff mass of 500 kilograms.

A large number of ULAs has been procured from French firms by the Iranian Islamic Revolutionary Guards since in 1987. Some of them have been transferred to the pro-Iranian Hezbollah group operating in Lebanon, and others are being used to train suicide pilots and fighters in Iran. The "ultralights" could also appear in the armed formations of the "irreconcilables"—closely linked with the Islamic world—in Afghanistan as well. And there can be no doubt as to how they are inclined toward our country. A fanatical pilot who has decided to cross the Soviet-Afghan border in a superlight aircraft will hardly be taking flowers with him.

Our press has already reported on a multitude of attempts at the illegal shipment of weapons onto the territory of the USSR for the various ethnic formations. The lightmotor aircraft can also find application there. The use of retrofitted motorized hang-gliders as reconnaissance and sabotage aircraft in acts against the forces of law and order, for example, cannot be ruled out.

How to See the Unseeable

I think it would be incorrect, as is fashionable today, to curse the anti-aircraft defense forces alone for the lack of means to fight armed lightmotor aircraft. The problem has proven to be very complex. The low effectiveness of traditional AA defense in countering unsanctioned flights by ULAs is characteristic of all nations. Recall the unpunished flights of the "Black Baron" in the skies over Paris.

The anti-aircraft weapons and aircraft of the AA troops are able to defeat comparatively fast targets at altitudes of more than 60 meters. The small lightmotor aircraft, however, cannot "rush" any faster than a bicyclist and is scarcely higher than the tops of trees. It is difficult to detect such a target on the screens of ground radar.

As the chief of the general staff of the air-defense forces, Col Gen Avn I. Maltsev, stated in a discussion with a correspondent from KRASNAYA ZVEZDA, in order to see everything that crosses the border at low altitude, we would need to place radar subunits every 30-40 kilometers. The complete coverage of the border would require no less than three billion rubles. Therefore, he feels, the priorities must be defined—either we will perform our principal mission, or we will fight aerial hooligans.

Perhaps he is right, and the air-defense troops should be left with the missions they are able to perform, entrusting the things that are beyond their abilities or wasteful—fighting ultralight aircraft—to others. But I am convinced that we cannot be reconciled to the aerial criminals. Illegality can give rise to an avalanche of violations of the law and crimes. And if we are not ready for it, aerial contraband dealers and terrorists could cause a lot of damage.

Perhaps, taking into account the fact that fighting them is the direct responsibility of the border troops, we should entrust them with opposing the aerial violators? The concentration of monitoring ground and air space (at low altitudes) in the border zone would ease the interaction of the various subunits with modern equipment.

It seems more expedient to use long-range radar detection aircraft for observing the border airspace, taking into account the large amount of spending on the creation of a thick network of ground stations. They are able to get a bearing on a small target at considerable distances. The cost of these aircraft, however, is quite high. One Boeing E-3 Sentry, for example, costs over 100 million dollars. Only 34 of them have thus been built for the U.S. Department of Defense, and they are used in the interests of "large" air defense.

A "cheaper" solution is the creation of special border aircraft for aerial observation. The countries of the West already have comparatively light and simple aircraft fitted with radar for the detection of low-flying targets with small radar cross-sections, supplemented with electro-optic sensors. Information from the latter can be processed on board or transmitted by data channel to a ground command station. The British Pilatus-Britten-Norman AE Defender with a takeoff mass of 3,600 kilograms is able to be aloft for more than nine hours, and is fitted with the Skymaster pulse-Doppler radar, able to conduct observations over a radius of 100 km and track up to 100 aerial and 30 ocean targets simultaneously. It costs 18 million dollars.

Another radar-detection aircraft, the Fairchild-Republic Metro 3, costs the same amount and was created jointly by American and Swedish specialists. It is able to patrol for four to six hours at a distance of 185 km from its base, and its radar with an antenna outside the fuselage has an operational range of 300 km.

Such aircraft could render substantial aid to border guards in fighting ground intruders as well. The infrared and television sensors installed on them make it possible to conduct observations of the ground situation and guide operational groups to the intruders. This opens up additional opportunities for the more efficient organization of all border service. reductions in the number of border troops and a decrease in the cost of man-made structures at the borders.

Features of Some Foreign ULAs

	Ayper QM-1	Schweitzer Firebird M-1	Zenith Aviation Baruder	Lascombe Rattler P-3
Length, meters	5.3	—	—	4.6
Wing area, m ²	14.9	15	—	13.7
Empty weight, kg	84	98	130	204
Maximum takeoff weight, kg	227	190	345	500
Engine power, hp	30	31	50	80
Top speed, km/hr	85	—	—	—
Cruising speed, km/ hr	76	60	—	145
Stall speed, km/ hr	39	35	—	—
Maximum range, km	400*	—	—	1,100**
Price	\$3,600	—	—	FF15,000

* With one passenger. ** With a load of 295 kg.

Experimental prototypes of these aircraft have already been created abroad. The American Vigilant, for example, is fitted with the FLIR forward-looking infrared system, a television camera and other special equipment. The flight deck for the operator and pilot is fitted with indicators. The former has a high resolution capacity and a large screen, while the latter is small in size. The operator can use the infrared system and the television camera simultaneously. The transmission range of the video information to a ground command station is about 160 km.

The installation of the Omega radio navigational system, intended for use with the GPS satellite navigational system, is being proposed for the aircraft. It has reduced noise levels and signature in the infrared spectrum, and quite powerful armaments located on eight wing hanger assemblies. The use of pods with 12.7-mm machineguns, 70-mm air-launched rockets and Stinger missiles is also possible. The wingtips have sensors that signal enemy radar emissions. The cost of the aircraft does not exceed a million dollars.

The Vigilant completed a test patrol at the border between the United States and Mexico at an altitude of 600-1,800 meters at a speed of 165 km/hr in the spring of 1989. The crew detected several intruders, and intercept units were directed to them.

A no less important task than detecting small airborne targets is determining their national affiliations and, where necessary, forcing them to land or destroying them. The Chicago Convention, which our state has

signed, bans the shooting down of civilian aircraft. This is a humanitarian rule. But it puts the pilot of a patrol aircraft in a disadvantageous position if he has to deal with an armed smuggler or terrorist. An interceptor should obviously have a greater range of speeds than the intruder and possess good maneuverability, since the possibility of engaging in aerial combat cannot be ruled out.

Where can such planes be obtained? Many of the aforementioned requirements are met... by fighters from World War II and the early postwar years. It would hardly be expedient, however, to restart the production of the Yak-3, for example, or the La-11. New ones could be created, but time and funds are needed for that. But what about trying to adapt series-produced trainers for these purposes? The most suitable for this are the piston-driven aircraft. The Su-26, for example. But that aircraft is expensive and is produced only for a sporting elite. Then the Yak-52—a mass-produced plane. It is employed for basic training at air clubs, and it would thus be cheaper to refine and refit it without the need for setting up a new production line.

Helicopters are already being used in the most likely sectors for intruder flights. The appearance of combined aircraft with swivel propellers similar to the American Osprey vertical takeoff and landing aircraft is possible in the future. Despite the high cost, such an aircraft could prove useful thanks to its universality and high performance characteristics. A lesser number of them could execute a larger number of operations compared to helicopters.

I naturally make no claim to have the ultimate truth. The reliable protection of the country's air borders, of course, requires no small amount of manpower and equipment, but won't we lose much more from the aerial revelry of smuggling and terrorism?

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New Books on Training Psychology Reviewed

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[Article by Candidate of Psychological Sciences D. Gander under the rubric "The 'Trust Service' Information Department": "Psychology and Psychological Training for Flight Crews"]

[Text] Interest in psychological science and its recommendations has gotten appreciably stronger of late. This is understandable. The turn toward the person, concern for the development of the personality, knowledge of potential capabilities and the active utilization of the reserves of the human psyche today determine the effectiveness of any professional activity, the more so one as difficult and dangerous as flying. The practical task of aviation psychology today is to direct cumulative scientific knowledge toward the training of flight personnel and aiding them in making use of it to the greatest

benefit in this process. The theoretical foundations and instructional approaches to its resolution are set forth in new books intended for aviation commanders and physicians, teachers and instructors at service schools and the pilots themselves.

The textbook "Fundamentals of Aviation Psychology and Psychological Training of VVAUL [Higher Military Aviation School] Cadets" was prepared in the form of lecture materials.¹ It has two sections. The first opens up the subject and the problems of aviation psychology. It sets forth in accessible form the theory of the psychological type, its role in the activity of the pilot and the techniques for formulation when preparing the cadet for flight. A considerable portion is devoted to the scientific determination of the personality of the pilot and the aviation collective. Problems of the psychological compatibility of crews are raised. A special chapter is devoted to such an important phenomenon as stress in flight, and its causes and ways of preventing and overcoming it are shown.

The second section includes issues of moral preparation for training flights. The activity of the pilot in special cases is revealed. Approaches to determining the psychological readiness of both an individual pilot and the aviation collective are set forth.

Another publication is devoted to the psychological training of flight personnel.² The capabilities of the person to control modern aviation equipment depends more and more on trainability and teachability. A suitable place, however, is not yet being relegated to this in the course of combat training due to a simplistic understanding of its substance and the poor instructional armamentarium of specialists. The book fills in that gap to a considerable extent. It gives an integral depiction of psycho-physiological training as one type of professionalization of the flight personnel, namely raising the functional reliability of their behavior under extreme conditions.

The authors devote considerable space to setting forth the problems, basic principles and instructional concepts for psycho-physiological training of the personnel. It is shown in the concluding chapter how the separate methods are formed into integral programs for teaching fliers the execution of the most important types of flights and operations in extreme situation. The programs, along with the specific features of the activity of the pilot, are included in the sets of techniques for his training for the performance of this or that mission. The proposed list, however, does not encompass the whole volume of courses for combat training. The instructional material that is included, however, can be utilized successfully for the organization of work with people in such a manner as to reflect the specific conditions of the combat training of fliers, the experience and individuality of the flight personnel and the specific features of the operation of aircraft equipment.

These books are distinguished by a high scientific level and a clearly pronounced practical thrust. That is all the more important, since they will be used as widely as possible in the air units.

Dear fliers, if you wish to raise the effectiveness and safety of flight operations, do not refuse the assistance that the aviation psychologists offer you!

Footnotes

1. "Osnovy aviatsionnoy psikhologii i psikhologicheskoy podgotovki kursantov VVAUL. Materialy k lektsiyam po uchebnoy programme kursa" [Fundamentals of Aviation Psychology and Psychological Training for VVAUL Cadets. Materials for Lectures for Curriculum Course of Study]. Edited by V.A. Ponomarenko. Moscow: VVS Publishing House, 1990—198 pp.

2. "Psikhofiziologicheskaya podgotovka letnogo sostava" [Psycho-Physiological Training for Flight Personnel]. Edited by V.A. Bodrov and V.A. Ponomarenko. Moscow: VVS Publishing House, 1989—169 pp.

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DOSAAF Flying Clubs Suffering From Cutbacks

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[Article by Tula Flying Club imeni B.F. Safonov instructor pilots A. Kosyakov, V. Matovitskiy, N. Timokhin and A. Yurasov: "By Enthusiasm Alone"]

[Text] Tula Flying Club imeni B.F. Safonov instructor pilots A. Kosyakov, V. Matovitskiy, N. Timokhin and A. Yurasov relate the unfavorable situation that has taken shape in the aviation of USSR DOSAAF.

The flying organizations of DOSAAF are experiencing a profound crisis. The impression is taking shape that the state of affairs in them and the results of the work are of interest to no one.

The principal mission of the flying clubs—of which there are about 70 in the country—since 1984 has been the training of cadet pilots from among those studying at secondary schools before induction into the airborne forces, sports pilots, parachutists and aircraft modelers. The main part of the work is training youth to enter the service schools of the air force and the air-defense forces.

Youth who have reached 15 years of age complete training in Yak-52 aircraft for two years. Flying time totals about 45 hours therein, with five hours of solo flight. Upon completion of secondary school they are sent to pass competitive entrance examinations to the service schools for pilots.

Our flying club, in accordance with the USSR Council of Ministers decree of 11 Sep 85, trains young men for the Stavropol VVAUL [Higher Military Aviation School].

But what is surprising is that they have no conception that they are our sponsors. Youth who have received basic flight training enter the service schools on equal terms with the remaining entrants, even though they already have certain skills for working in aviation.

This situation is observed everywhere in our country. Flying clubs specially train young men, but they are brushed aside by the air force and air defense higher educational institutions. The opinion is current for some reason that it is more difficult to retrain a pilot from piston to jet aircraft than it is to train them fresh. That can be argued only by those who have never flown either the one or the other. Practice shows that almost all of the pupils from the flying clubs that enter the service schools fly quite confidently, and complete them with the firm intention of devoting their later lives to aviation. It is principally those who are not familiar with it who are let go. No little of the people's money is tossed to the wind as a result.

The cutbacks in the armed forces, and especially the disbanding of a number of flight schools and cutbacks at those remaining, are also having an effect on the work of the flying clubs. This process is understandable, and we approve of it, but the opinion has become widespread against that background that the number of flying clubs must also be cut back, since they, as they say, will be running idle. The solution of the problem is being entrusted to the local authorities (up to the level of the DOSAAF oblast committees), and they look at it this way: the organization provides no profits in a pure form, and that means it is of no use. And they conclude, as a rule, that the material allocations must be reduced or cut off. Cut off to the extent that the activity of the flying clubs is virtually halted. Verily they say that the miserly pay twice!

This decision cannot be considered correct for a number of reasons. We see the mission of the clubs as training young men not only for service in the army, but also for entry into the service schools or higher educational institutions of civil aviation and institutes and technical schools of the aviation industry. The main thing, after all, is to attract the young person to aviation, and he will later choose his own road for himself.

It is painful to see how the romanticism and aspiration to serve in the air force among the young are being squandered. There is no influx of fresh manpower to the aviation industry either, and the competition for its institutes continues to drop.

The flying clubs could train cadets in smaller amounts, but with better quality and with more flying time (the plan, by the way, is handed down from on high, without any regard for the difficulties caused by objective factors). We have no domestic aircraft that is easy to control, simple to operate and cheap for the initial training. Superlight aircraft are lacking, even though it has long been singled out as a separate type in the West.

Individual creativity in the realm of aircraft construction is maintained by raw enthusiasm alone.

There is no better way to destroy flying types of sports than to convert them to self-support [*samookupayemost*] too soon. The latter is senseless until there are reliable and, at the same time, cheap aircraft. The Yak-52s currently being operated in the flying clubs cost the state 150,000 rubles (produced in Rumania), while one hour of flight time in them costs 150 rubles.

The Yak-55 aircraft that recently entered service has a service life of just 250 hours, but it doesn't even hold to that—it falls apart before that and can, according to our forecasts, cause no little harm, as happened with the Yak-50. It is incomprehensible—what were the designers thinking about when they were creating such a craft, and where was the DOSAAF Central Committee leadership looking in accepting it from industry?

The creation of special boarding schools with basic flight training requires every support. Such a school should be opened in the city of Bryansk in 1990, although the plans for the idea have not been developed. We do not know why not, but it can be assumed that parochial departmental barriers, bureaucratic hurdles and financial difficulties have appeared in its way.

The saturation of our country with flying clubs is not great compared to foreign countries. They have many more per unit of space there. And it turns out that even an inhabitant of our region, not to mention the oblast, does not always have an opportunity of engaging in local flying clubs. And there are those who wish to do so. The liquor lines have not yet enticed them...

The aim of our presentation is to attract attention to the situation that has taken shape surrounding the flying clubs and will have to be corrected at some point. Would that it not be too late!

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Material Liability of Servicemen for Damages Explained

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[Colonel Justice K. Kozlov answers the questions of officers studying in the legal-education system under the rubric "Law and the Army: "The Material Liability of Servicemen"]

[Text] [Question] What documents codify the legal foundations for the material liability of servicemen?

[K. Kozlov] The material liability of servicemen for damages caused to the state is defined by the Constitution of the USSR, as well as the requirements of the oaths and regulations. They establish the obligation of every citizen of the USSR to care for and multiply the popular good and the arms, equipment and other

matériel entrusted to the serviceman. The use of military matériel for other than its intended purpose or its damage or destruction causes damages to the state, reduces combat readiness and is a violation of the requirements of Soviet laws and military discipline. Those guilty of it are subject to disciplinary action and material and, in cases stipulated by law, criminal liability.

The conditions, procedure and size of reimbursements for losses that are inflicted are defined in concrete terms by the Statute on Material Liability of Servicemen for Damages Caused to the State as approved by Ukaz No. 10661-Kh of the USSR Supreme Soviet of 13 Jan 84 and announced by order of the USSR Minister of Defense in 1984, as well as the Manual for Legal Work in the Soviet Army and Navy that took effect by order of the USSR Minister of Defense in 1987.

[Question] Under what conditions does material liability ensue?

[K. Kozlov] It could ensue in accordance with the Statute cited for servicemen and reservists called up for exercises for damages caused by them in the performance of official duties provided for by the military regulations, orders and other documents. They bear material liability under general civil procedure for such cases that are not in the performance of their official duties. For conscript servicemen this is during periods of leave, discharge or voluntary departure from the unit. The remaining categories of servicemen are considered to be performing duties during official time on the territory of the military unit or in the execution of a specific assignment of the commanders.

Material liability ensues only when they are to blame for the actions causing the damages. It is absent, as a rule, if the ruin of matériel arose during the conscientious execution of the order of a commander or superior officer or was justified under the given specific circumstances of service risk or legitimate action.

Liability ensues for actual or real damages, which comprise the cost of the damaged, destroyed or missing parts, with the exception of cases of material liability on an enhanced scale, as well as the cost of restoration work for a unit or device. The total losses of transport equipment and other expenses confirmed under established procedure, for example, are also part of the damages for the owners of individual transport vehicles.

And, finally, material liability ensues if a direct causal link is established between the action or inaction of the guilty serviceman and the damages.

The absence of even one of the enumerated conditions gives no grounds to subject a serviceman to liability.

[Question] What is the size of the reimbursement for damages?

[K. Kozlov] Three types of liability exist—limited, full and enhanced.

Limited is established for damages in the negligent performance of official duties. The dimensions of it correspond to the damages caused, but are no greater than the monthly pay for warrant officers, servicemen on extended military service, women who have completed basic military training as soldiers, sergeants and petty officers, officers and generals, 100 rubles for conscript servicemen and cadets and 150 rubles for reservists who are called up for exercises, with the exception of cases in which other limits for material liability are provided for by legislation in force.

These same conditions extend to commanders (senior officers) for damages caused to the state by their subordinates when they have violated the stipulated procedure for accounting, storage, utilization, consumption and shipment of military matériel through their own incorrect orders, did not take the necessary steps to avert its theft, destruction, damage or spoiling, as well as reimbursement for damages caused to the state by the guilty parties. Warrant officers, servicemen on extended military service, officers and generals bear material liability on the same scale for the idle time of railcars, vessels etc. through their own fault.

The size of the actual damages, but no more than three months' pay, is withheld from commanders (senior officers) in military units, institutions, military teaching establishments, enterprises and organizations guilty of the illegal dismissal or transfer of a manual or office worker to different work. Liability ensues in that case if it is done in clear violation of the law or if the execution of the decision of a court or authority higher in subordination to the commander (or senior officer) on their return to work is hindered.

Material liability for the full amount of the damages caused ensues in cases of: intentional destruction, damage, ruin, theft or illegal consumption of military matériel or the causing of damages by other intentional actions regardless of whether they contain the elements of offenses prosecuted under criminal procedure; the overstating of work actually not performed in orders and other documents, distortion of report data and deception of the state in other forms; shortfalls, as well as destruction or ruin of military matériel, transferred and reported for storage, shipment, issue, use or other purposes; causing of damages by an individual who is in an intoxicated state; causing of damages by actions (or inaction) containing the elements of a crime.

Enhanced material liability ensues for the theft, squandering or loss of tactical air or special clothing, personal kit or other individual types of military matériel in a multiple of its cost. The size of the multiple is established under the procedure defined by the USSR Council of Ministers.

Enhanced material liability by a factor of three ensues for individuals guilty of theft, shortage or loss of meats and meat products, and the factor is 2.5 times for milk

and dairy products, under the procedure defined by the requirements of the order of the USSR minister of defense of 1983.

Servicemen, as all the citizens of our country, pay ten times the cost of books not returned to the library or lost, if the damages are not reimbursed with a book of equal value, as defined by the USSR Library Statute approved by ukaz of the Presidium of the USSR Supreme Soviet on 13 Mar 84.

[Question] What is the procedure for determining the size of the damages and the reimbursements for them?

[K. Kozlov] The commander (senior officer) of a military unit, institution, military teaching establishment, enterprise or organization, upon detecting damages, orders an administrative investigation to establish the reasons for the appearance of the damages, the dimensions of them and the guilty parties. The investigation should be concluded within a month. It may be prolonged where necessary by a higher commander (or senior officer), but not by more than one month.

The investigation is performed in any form, but its results are formulated in written form. The guilty parties also provide written explanations. Various documents corroborating its results are also part of the materials of the investigation—copies of checks, invoices, inspection documents, waybills and the like.

The administrative investigation should establish what the damages consist of and what their monetary valuation is, specifically what incorrect actions caused it, what laws, military regulations, orders, instructions or other stipulated rules were violated therein, whether the damages were caused intentionally or through negligence, whether the guilty party was engaged in the performance of official duties, and what circumstances facilitated the damages caused.

The party that ordered the investigation, and where necessary the higher commander (senior officer), issues an order on the exaction of the corresponding sum of money from the guilty party and passes it on under receipt within a month from the end of the administrative investigation. The order may be appealed under the procedure stipulated by the Disciplinary Charter of the Armed Forces of the USSR, which does not halt the withholding. The amounts withheld are returned if the order is abrogated.

The size of the damages is determined according to the actual losses on the basis of accounting data proceeding from the retail prices or, if they are lacking, according to the prices computed using the procedure stipulated by the USSR State Committee on Prices, with a regard for the depreciation of military matériel according to stipulated norms.

The value of a first-category wool jacket with belt, if it is lost, for example, will be as follows: 171 rubles \times 1.5 = 256 rubles 50 kopecks. Footwear lost in the 13th month

(a lifetime of four years) is $171/48 \times (48 \times 12) \times 1.5 = 192$ rubles 38 kopecks. The multiple is 1.5.

The amount subject to reimbursement, allowing for the multiple, is $171 \times 1.5 \times 5 = 1,282$ rubles 50 kopecks, and for the footwear lost in the 13th month it is $171/48 \times (48 \times 12) \times 1.5 \times 5 = 961$ rubles 90 kopecks.

The amount may be reduced in exceptional circumstances by the commander (senior officer) with the written permission of a higher official, or in suitable cases by a court depending on the circumstances under which the damages were caused, the degree of guilt and material situation of the guilty party. Crimes committed for mercenary purposes constitute an exception.

Cases where the guilty parties are conscript drivers/servicemen in road accidents who have caused material damages on a scale that does not permit them to be subject to criminal liability are gross violations of legality, and are reimbursed under various pretexts on the part of the command to the owners of the vehicles that were damaged personally, getting money from next of kin. The military unit is obliged in such cases to make restitution for the damages to the owner of the vehicle, while a conscript serviceman should be subject to material liability for a sum of no more than 100 rubles.

[Question] How do servicemen who have been discharged from active military service or reservists who have completed exercises make restitution?

[K. Kozlov] Executive notices of notary bodies are sent to the people's court at the place of residence (or work) within ten days. The commander (senior officer) submits information on the form stipulated by Directive No. D-22 of the deputy minister of defense of the USSR in 1976 to obtain the executive notice.

An entry is also made in the pay booklet and court order on the amount of the indebtedness subject to collection.

An accounting of the amounts of unreimbursed damages due from those discharged into the reserves is made at the military commissariats, and the completeness of their payment is monitored.

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Soviet Air Force Participation in Korean War Described

91SV0003N Moscow AVIATSIYA I KOSMONAVTIKA in Russian No 10, Oct 90 (signed to press 15 Oct 90) pp 30-31, 34

[Article by Hero of the Soviet Union Lieutenant-General (Retired) G. Lobov under the rubric "Blanks Spots in History": "In the Skies of North Korea"]

[Text] Behinds the Lines of Official Reports

Insofar as the events that will be discussed were long a "blank spot" in our history, I remind the readers that the

war in Korea began on 25 Jun 50 with an armed clash of major groups of ground forces of the PDRK [People's Democratic Republic of Korea] and South Korea. It had been preceded by a multitude of border incidents and clashes.

At that time there were no foreign troops on the Korean peninsula aside from a small number of military advisers. Both governments—the PDRK and South Korea—had proclaimed themselves “the sole legitimate” representatives of the whole Korean people. Regardless of who started the combat operations, the conflict at first was of the nature of a civil war. It is important to note that it was unleashed during the height of the “cold war,” at a time when the United States had lost its monopoly on the atomic bomb.

A UN Security Council meeting was held on the same day that the armed conflict began, at which meeting the United States accused the PDRK of aggression. The representative of the PDRK declared in turn that the instigator of the war was the Syngman Rhee government of South Korea. The permanent representative of the USSR to the UN Security Council, Ya. Malik, did not take part in this or subsequent discussions that covered the Korean question as a sign of protest against the presence of the Kuomintang occupying the position of legitimate representative of the People's Republic of China on the council.

I will not take it upon myself to judge how much this boycott facilitated the restoration of justice, but it had a negative effect on the events in Korea. The USSR did not enjoy the right of veto at the time, which allowed the United States to achieve *de facto* approval of its intervention in Korea, and then to cloak it all under the peaceful flag of the United Nations.

Three days following the start of combat operations, the North Koreans were able to win a major victory and enter Seoul. The Syngman Rhee government fled south. The internationalization of the conflict occurred at that time. Ground forces of the United States landed in Korea (the American Navy and Air Force had taken part in the war virtually from its beginning). The offensive of the PDRK army was slowed, although in the Pusan and Taegu sectors certain successes were noted. A small shred of territory remained under the control of the Syngman Rhee government—the so-called Pusan-Taegu beachhead.

The U.S. incursion forces were declared to be UN troops on July 4. Another 15 nations joined the “march against communism.” Their solidarity, however, was of a symbolic nature, insofar as the American contingent constituted the main force of the allies, while the commander-in-chief of the interventionist troops was the not-known General MacArthur.

The war in Korea had meanwhile taken on more and more of a grave and tragic nature. The United States and South Korea had concentrated a group twice as large against the 70,000-man army of the PDRK in the Pusan

sector. The United States landed the 10th Tank Corps from the sea in the area of Seoul on September 15 and went over to the counter-offensive. The main forces of the North Koreans became encircled, suffered large losses in manpower and were virtually stripped of artillery and tanks. Small groups that retained their fighting ability were forced to battle their way north.

A majority at the 5th session of the UN General Assembly, obedient to the Americans, sanctioned the crossing of the 38th parallel by the interventionist troops and the *de facto* occupation of the PDRK. The aggressors had reached the close approaches to the PRC and the USSR in October of 1950. An extremely tense situation had also taken shape there. A little-known provocative act by the United States against the Soviet Union, for example, belongs to this period. Two F-80 jet fighter-bombers, in clear weather with excellent visibility of the shoreline (ruling out a loss of orientation by the crew), conducted an assault against the Sukhaya Rechka air force base of the Pacific Fleet located a few dozen kilometers from Vladivostok.

The Korean people did not remain alone in their heroic struggle. The Soviet Union and the People's Republic of China rendered fraternal internationalist assistance to them. This was more than material and moral support. Chinese volunteers entered the battles against the interventionists at a critical time for the PDRK on October 25, and formations of Soviet jet fighter aviation came in in November.

The situation by the end of the fall was quite complex. The Korean troops and Chinese volunteers had been able to throw the Americans back from the Yalu (Amnokkan) River and were pressing them to the south. American aircraft ruled the skies, however, continuing active mass operations day and night to destroy cities and towns, troop formations, lines of communications and other targets on the territory of the PDRK.

The United States concentrated an enormous quantity of aviation in the theater of military operations. The book “The U.S. Air Force” by A. Broffy notes that “The U.S. Air Force in the Far East Zone included the 5th, 13th and 20th Air Armies and a logistical command at the start of the war in Korea.” The aircraft fleet, according to the testimony of the U.S. Air Force commander in the Far East Zone, Gen Otto P. Wayland, later doubled in size and totaled over 2,400 combat aircraft. To this should be added the British carrier-based aircraft, a detached Australian squadron and the aircraft of the Syngman Rhee regime.

The air force of the United States was able to seize air superiority virtually from the first weeks of the war. The North Korean Air Force, small and equipped only with piston aircraft, offered courageous resistance to the aggressors, but without modern equipment suffered defeat to an enemy tens of times larger in size. All airfields on the territory of the PDRK were destroyed.

The fighters of the PRC had at that time just converted to jet aircraft and were not ready for combat operations.

Under these circumstances, the governments of the PDRK and the PRC appealed to the Soviet Union for direct military assistance using jet aircraft. It was sent to China as a basing location. The fighter formations were commanded at various times by the renowned Soviet fliers I. Kozhedub, A. Alelyukhin, A. Kumanichkin and A. Shevtsov, among others. First one of the air formations, and then the whole group of Soviet fighter aviation, were also commanded by me.

An anthology titled "Air Power—The Decisive Force in Korea" was published in America under the editorship of G. Stuart. The first part of the book, which largely defines its content and conclusions, was written by the deputy commander-in-chief of the interventionist troops and, simultaneously, the commander of the U.S. Air Force in the Far East Zone, General Otto P. Wayland. It contains no material corrections whatsoever to the remaining materials of the anthology. The views, facts, figures and conclusions belonging to other authors evidently coincide with the opinion of the leaders of the U.S. Air Force. I will permit myself to refer as necessary to the materials in the anthology as translated and published in the USSR in 1959.

The plans of the U.S. Air Force command allotted a significant place to operations to destroy the peaceful population of North Korea and test new types of weapons. An excerpt from the plan to destroy the dams of reservoirs was found among the remnants of a B-26 bomber shot down at night by Soviet anti-aircraft gunners. This plan had the sinister name of "Suffocation." The Americans themselves have moreover written candidly on the purpose of such actions. The journal QUARTERLY REVIEW noted that the destruction of the irrigation dams "signified first and foremost the deprivation of its principal foodstuff—rice—for North Korea." And further: "...depriving a resident of Asia of this basic foodstuff signifies hunger and slow death for him."

I had occasion to visit China and the PDRK as part of a group of formation commanders of fighter aviation for the purpose of studying the experience of the war. We saw the results of a mass strike by 79 B-29 bombers on the city of Sinuiju literally the next day. There were no military targets in the city. An airfield and fords of the Yalu River were right alongside, but not a single bomb landed on them. The goal of the strike was completely clear—the destruction of the peaceful population of the city and the multitude of refugees from places occupied by the interventionists or destroyed. The people who remained alive dragged their dear ones from the fires with long poles with hooks.

I involuntarily recalled 1945. Soviet units were advancing energetically in the direction of one of the major cities of Germany—Dresden. And at that time the Allies, at their own initiative and without informing the

Soviet command even though the city was in the zone determined for occupation by Soviet troops, subjected it to massive bombing. Dresden was significantly destroyed. Hundreds of thousands of people perished. But not a single bomb fell on the airfield of Klotzsche, located in its environs, even though a school for Luftwaffe pilots was located there. Five years had passed, and Sinuiju is far from Dresden, but the style of the operations of the U.S. Air Force remained the same. And Hiroshima and Nagasaki had already happened...

Since the manning levels of the air formations being sent to Korea was several times less than usual, the Soviet pilots were selected only from among volunteers, and some fliers even had to be turned down. The very best were selected from among the best. Many pilots had experience in battles against the German fascist usurpers.

The MiG-15 was the principal jet fighter in Soviet aviation at the time, and was superior in its chief parameters to the analogous aircraft of the enemy, with the exception of the F-86. It had a better rate of climb and thrust-to-weight ratio than the MiG, but was somewhat inferior in maneuverability and the radius of operations. Their maximum flight speeds were roughly equal. An axial engine provided the F-86 with a better aerodynamic shape for the fuselage. The fighter gained speed faster than ours in diving and had less "settling" than the MiG-15 when coming out of a dive.

The armaments of the MiG-15 were more powerful and consisted of two 23-mm and one 37-mm cannon that were well placed. The fighters and fighter-bombers of the United States had six large-caliber machineguns apiece—the 12.7-mm Colt Browning—widely spaced on the wings. The better sighting equipment of the F-86 was a significant advantage, especially the radio rangefinder that automatically made corrections in the range. The distance to the target from the MiG-15 was determined visually, with the data entered into a semi-automatic sight manually.

Both our fighters and the American ones were upgraded in the course of combat operations. The MiGs began to be equipped with the VK-1 engines, with greater thrust, starting in April of 1951. The aircraft received the designation MiG-15bis (so as not to complicate the text, I will use it without the variations below). A periscope was installed on it for scanning the rear quadrant, along with Sirena gear warning the pilot of the operation of the F-86 rangefinder. The ejection seats were equipped with automatic devices to deploy the parachute at a pre-assigned altitude.

All of the Soviet aviation and anti-aircraft artillery was part of the 64th Detached Fighter Air Corps. In 1952 it included three air and two anti-aircraft artillery divisions (armed with 85-mm cannon, 57-mm automatic anti-aircraft guns and radar stations for tracking and laying in the guns), an aviation technical division and three detached regiments—the "night" people, a fighter

regiment of naval aviation and a spotlight regiment (to support the operations of the crews at night and to create a light field in the area of the Yalu River fords and the approaches to them)—two hospitals and other subunits of the support services.

The corps numbered about 26,000 people in 1952. This number of personnel was preserved until the end of the war in Korea. The battleworthiness of the military contingent, as is well known, is determined not using the number of combat entities, but their complement. We were far below even standard requirements from that standpoint. Only half of the divisions had up to three regiments. The rest had two. They were supposed to have 32 pilots, according to staffing requirements. The anti-aircraft gunners were in the same unenviable position.

The system for manpower acquisition in effect at the time also caused us no few difficulties. The aviation formations and units during the Great Patriotic War, or at least during 1943-45, were replenished in advance with trained pilots before impending battles or during the course of them. Fighting ability was maintained at an adequate level thanks to that. The Americans operated roughly the same way in Korea. Their pilots, having completed a certain amount of combat sorties or been removed from flights for whatever reason, were sent back to their units. New ones came to replace them.

The replenishment of the corps was accomplished via the complete replacement of recovered divisions. Our military and political leaders evidently felt that this procedure for "freshening" would significantly raise the combat capabilities of the 64th. This led, however, to the fact that newly arrived units and formations abounded in personnel who had not experienced battle. The replacements also had a vague understanding of operational tactics and the practice of combat flights in Korea. Everything concerning the participation of the Soviet Air Force in this war was moreover secret. The experience of the 64th has thus not only not been studied or assimilated among the troops, but even has remained under the strictest prohibition.

It was moreover namely during that time that the priority of combat proficiency came to be below flight safety in many air units. The air commanders of all ranks were forced to move toward a lessening and simplification in training. Training flights, for example, were conducted in dense combat formations and, as a rule, with external tanks, which restricted maneuverability. Free aerial battles at top speeds were replaced with so-called "standard" attacks and simulated bombing runs against targets that were actually not maneuvering or offering any resistance whatsoever. These practices had to be changed when training flight personnel for command. But we unfortunately had to engage in the process of combat operations with the newcomers ourselves.

We had to turn to the higher authorities more than once due to the imperfections in the system of replacement

and training of the personnel being sent to Korea. But everything remained as it had been. I suppose the reason for that was the open opposition of the leaders of the air force and the air-defense troops. After all, it was far easier to move divisions around with the stroke of a pen than to prepare each regiment and each pilot for the impending battles...

Soviet air units entered battle in sequence. The number of fighters increased to the extent of the complication of the aerial situation. It never approached the fantastic figures that are cited by the Americans, however. The total number of our aircraft that were in action never exceeded the complement of the 4th and 51st Fighter Air Wings of the 5th Air Army. We were eight to ten times inferior in numbers if one takes into account all of the fighters, fighter-bombers and bombers of the United States that had to be fought.

The situation, I note once more, remained very difficult. We had to wage combat operations alone against the multitude of aircraft of the interventionists that had the initiative as the attacking side. It included all branches of the air force and had a large number of jamming aircraft, as well as the all-weather F-94 aircraft with on-board radar, and made use of a far-flung and well-equipped network of airfields.

The situation of the defending side forced the Soviet fliers to be on alert in the cockpits of their fighters awaiting sorties for a long time. This was real torture under the conditions of the damp and hot climate. The Americans operated according to plans developed ahead of time and did not experience such difficulties. They moreover possessed a large reserve of flight personnel that we did not have. The fighter pilots of the U.S. Air Force were better able to withstand the G-forces in dogfights through the use of special suits. We did not have them at the time.

Many difficulties also arose in connection with the ban on operations over the ocean and the pursuit of enemy aircraft south of the Pyongyang-Wonsan line. The Americans made skillful use of this circumstance. They waged aerial battles principally near the coastline. If they got into an unfavorable situation they quickly headed for the sea and from there, after selecting the proper moment and gaining the necessary altitude, re-entered the battle or retreated without interference. Our airfields, despite the special resolution of the UN banning the crossing of the border of the PRC, were constantly under the influence of enemy fighters attacking Soviet—and, later, PDRK and PRC Combined Air Army (CAA)—aircraft in takeoff and landing.

The mountainous terrain sharply limited the capabilities of radar stations to detect and track aircraft. The commanders of Soviet fighter aviation thus had to make decisions in a difficult environment in the shortest of time spans. It was not always possible to intercept targets in time, in the optimal combat formation or at the most advantageous altitude in that regard. Our forward-based

aviation moreover suffered from an acute lack of airfields. At first there was only one—Andong—until the airfield at Miaogou entered service in July of 1951 along with Dapu in 1952. CAA aircraft were later based there and separately at Dagushan. This congestion significantly reduced the operational efficiency of the employment of Soviet fighters. The Americans, who also complained about a lack of airfields, forget that they always had sufficient time at their disposal to put the necessary number of aircraft into the air. We had to fly out unexpectedly and put up major fighter forces from a small number of airfields, which was very difficult to do quickly, sometimes even impossible.

I feel that such a detailed introduction to the story of the combat operations of Soviet fighters is essential because one cannot understand and depict clearly the course of aerial warfare in Korea overall without a knowledge of the conditions and environment in which we had to fight. (*Continued*)

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Latest Soyuz/Mir Cosmonauts Profiled

91SV00030 Moscow AVIATSIYA I KOSMONAVTIKA
in Russian No 10, Oct 90 (signed to press 15 Oct 90)
pp 44-45

[Article by V. Lyndin under the rubric "Stories About Cosmonauts": "Carrying the Baton"]

[Text] The Baikonur steppes have long been accustomed to the thunderous roars of rockets taking off. This last occurred on 1 Aug 90. A vast fairy-tale object slowly began to rise in columns of smoke and flame, carrying on the flight deck of the Soyuz TM-10 craft Earth emissaries Lt Col Manakov and flight engineer, pilot and cosmonaut of the USSR Strelakov. Both are Gennadiy Mikhaylovich... There has never been such a coincidence in any space crew. Two Aleksandrs recently went, up, it is true—Viktorenko and Serebrov. The operators at the flight-control center called them Stepanych and San Sanych in familiar fashion to distinguish them.

The new envoys had the call signs Vulkan-1 and Vulkan-2. They will think of something for addressing them unofficially, there will be enough time for that.

Meanwhile the mighty rocket, accelerating continuously, was bearing them further from their home planet. The "Vulkans," comfortably ensconced in their seats, were talking with the ground.

"The engines are operating in stable fashion. The flight is fine," reports the crew, and the telemetric information confirms their reports.

"We have separation of the first stage."

This was the release of the four side units comprising the first stage of the launch vehicle, having expended their fuel. The G-forces acting on the crew dropped sharply,

and then began to increase again. The weight of the cosmonauts had tripled by the end of the operation of the second stage.

"We have jettison of the nose cone."

The dense layers of the atmosphere had been traversed, and the need to protect the ship from the oncoming rush of air had receded. The black sky of space was displayed in the portholes.

But the path into orbit continued. Having fired for the proper amount of time, the engine of the third and last stage of the launch vehicle shut down. The separated craft began independent flight. The crew began checking their on-board systems. Ahead was docking with the Mir orbital complex, where they were to take up their shift in space, taking the relay baton from Anatoliy Solovyev and Aleksandr Balandin who were working there.

The commander of the Soyuz TM-10, Gennadiy Manakov, was born on 1 Jun 50 in the town of Yefimovka in Andreyevskiy (today Kurmanayevskiy) Rayon of Orenburg Oblast. His parents were teachers and were able to instill in Gennadiy a love of knowledge. He completed school with excellent grades, and finished his training at the Armavir Higher Military Aviation School for air-defense pilots in the same manner. He had to rove across the country quite a bit over his years of service. He began around Kiev, then to the Far East, the Moscow region, the North Caucasus... He has been at the Cosmonaut Training Center [CTC] imeni Yu.A. Gagarin since 1988.

Many of the new recruits at the CTC complete training at the school for test pilots. Every space flight, after all, is still largely research, and in extreme circumstances the pilot is helped by skills acquired in testing aircraft. Manakov, who had received his certificate as a test pilot back in 1980, had no need to master that profession. Following the gravitation toward knowledge, toward the new, inherent in him since childhood, he always strove to fulfill the most difficult assignments and master the most complex equipment. He has flown virtually all fighters, mastered up to 40 types and variations of them and logged more than 1,600 hours of flight time in all. Military pilot 1st class Gennadiy Manakov also became a test pilot of the same level. It must be added that his résumé includes 248 parachute jumps and a certificate from the Moscow Aviation Institute.

The pull toward the new and unexplored also drew Manakov to space science. Many feel it was the logical continuation of aviation. And this is not without foundation. S. Korolev started in aviation at one time, and the chief designers M. Yangel, G. Babakin and A. Isayev were aviation engineers... The biographies of most Soviet and foreign cosmonauts started at the aviation schools.

Even though Manakov was officially counted among the cosmonaut corps in January of 1988, he had actually set about his studies much earlier. The official description of this says, "During the period from November 1985

through May 1987, he completed a program of general space training by the periodic training method." Gennadiy came into the detachment, in short, with quite a load of knowledge.

"The specific field—that is just what determines the meaning of his life," his comrades say of him. "He brings to it purposefulness, optimism and a spiritual youthfulness. A genuinely enthused person who has triumphed in his field. He knows how to infect others with it too."

In December of 1989 Manakov was named head of the crew that had Gennadiy Strekalov as its flight engineer. He is an engineer not only by education, but also by vocation. His labor biography began just three weeks before the start of the space era. Gennadiy went to the plant where they were manufacturing the first artificial Earth satellite. Strekalov was designated a pupil in the coppersmith's shop. And it was namely the mentors of Gennadiy—the most skilled craftsmen—who brought the outside of the first satellite to an ideal spherical shape by hand.

The Strekalov family was living in the Moscow region, in Mytishchi, but soon after Gennadiy was born they moved to Kaliningrad. He was born on October 28 of the prewar year of 1940. Caught the war out of the corner of his eye, as they say. But the memory of it has remained for his whole life. However many the years that have passed since 1945, the words of the notification could not be forgotten: "...death of the brave in battles to liberate Polish soil, at the small town of Belkhatuv..." After all, it was about his father...

When Yuriy Gagarin flew into space, Strekalov was studying in the second course of study at the Moscow Higher Technical School imeni N.E. Bauman, which, as is well known, has graduated many Soviet cosmonauts. He was sent after that to the design bureau of the Academician S. Korolev (today the Energiya Scientific-Production Association). The young engineer displayed exceptional abilities, took part in the development of space equipment and was employed for a long time in the management group at the CTC and on the ships of the command and measurement system.

He submitted his application to be included in the cosmonaut corps together with Vladimir Aksenov, Aleksandr Ivanchenkov and Valeriy Ryumin. They completed the medical certification together. "A unique case," the doctors joked at the time, "all four of them passed, no one could be rejected."

The space biography of Gennadiy Strekalov is a combination of good and bad luck. Like the majority of cosmonauts, he began as a backup, repeating this important level of flight preparation over and over. First he and Yuriy Malyshev were backups for Valeriy Bykovskiy and Vladimir Aksenov, the crew of Soyuz-22. Then, along with Vasiliy Lazarev and Valeriy Polyakov, Strekalov was part of the second crew for the Soyuz-T3. The first was Leonid Kizim, Oleg Makarov and Konstantin Feoktistov. The doctors, however, had doubts

about the health of Feoktistov not long before the launch. And they operate without compromise in such situations. It is enough to recall how Valeriy Kubasov and Aleksandr Serebrov were not permitted to take off right at the space center at different times, or how Vladimir Vasyutin and Aleksandr Laveykin were returned from orbit ahead of schedule. The least doubt, and medicine issues its sentence without appeal. An incident that is harsh for one thus helped another move closer to the time of his own launch.

The first flight of Gennadiy Strekalov was 30 hours long. The principal mission of the crew was to perform tests on the three-seat Soyuz-T series ship and to extend the service life of the Salyut-6 orbital station so as to complete flights on it by international crews as provided for under the Interkosmos program. The cosmonauts conducted a careful inspection of the station and replaced a number of instruments and assemblies. They performed a technological operation unique for the time, installing a new "heart"—a unit of hydraulic pumps—in the station's temperature-regulation system. The repair of the system was not envisaged in its design—that is, it was considered unsuitable for repair. The experience in performing these operations was taken into account in creating the new Salyut-7 station. Gennadiy Strekalov began training for a prolonged flight in it along with Vladimir Titov. But that work was not fated to occur...

Titov and Strekalov backed up the crew of the first principal expedition—Anatoliy Berezovyy and Valentin Lebedev—to which Aleksandr Serebrov was added before the launch. The launch into orbit went fine. The ship (this was a Soyuz-8) separated from the last stage of the launch vehicle. But when the cosmonauts set about checking the on-board systems it became apparent that the boom of the parabolic antenna for the convergence and docking system had not deployed to the proper position. The automated device was helpless without receiving information on the range and speed of approach of the ship to the station. Attempts to close with the aid of manual control via determination of the distance according to the grid on the viewing screen had no result...

The crew of the second principal expedition to the Salyut-7 station was Vladimir Lyakhov and Aleksandr Aleksandrov. Backups Titov and Strekalov were to replace them after four months of flight. And then came 26 Sep 83. The final countdown to launch had begun when flames suddenly appeared at the foot of the spacecraft. At first it seemed that the engines were operating, but the reddish-yellow dragon's flame was shooting upward, engulfing the body of the rocket...

The specialists went into precise action, putting the emergency rescue system into action. Solid-fuel motors mounted on the top of the rocket removed the spacecraft and its fairing to a safe distance. Titov and Strekalov landed about four kilometers from the burning launch pad.

Strekalov succeeded in getting to the Salyut-7 station six months later anyway. Flight engineer Nikolay Rukavishnikov had fallen ill before the first Soviet-Indian flight.

"Even though I came late to the crew," related Gennadiy at the time, "I understood from the first that I would be a full member here. I am old friends with Yuriy Malyshhev and we had worked together for many years beforehand. I was also glad that Rakesh Sharma had mastered Russian well. Since there was no language barrier, all remaining difficulties fell away."

Strekalov seemed not to have changed from one flight to the next. He was restrained and laconic, courteous and attentive as before. He had an ironic attitude toward himself. His attitude toward work can be expressed with the words exceptionally conscientious. With three space flights in his résumé, he was again among the backups. This, after all, allowed him to keep in shape and keep pace with the space technology, which is being developed and improved constantly.

"I worked as an engineer at a design bureau for many years," said Gennadiy Strekalov, "and I have a good idea

what efforts it costs to prepare each flight, how much money and manpower are invested in it, how many people are engaged in it. The conquest of space is a collective endeavor. The most visible stage of the common labor happens to fall to us. And the work starts long before the launch and continues after the return of the crew."

Manakov and Strekalov were backups for Solovyev and Balandin. They saw them off into space and followed the work on board the Mir space station attentively. And now the two Gennadiy Mikhayloviches are taking their turn in orbit, having taken the baton from their predecessors.

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Soviet, U.S. Extravehicular Activity Table

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[Unattributed listing under the rubric "At the Request of Readers": "Outside the Ship"; continuation of feature in issues No. 8 and No. 9]

[Text]

No.	Cosmonaut, Country	Spacecraft, Orbital Station	Date, Time Outside	Basic Results
37, 38.	A. Ivanchenkov, USSR; V. Kovalenok, USSR	Soyuz-29—Salyut-6	29 Jul 78, 2 hr 05 min	Dismantling and partial replacement of apparatus installed on outside of station. Cosmonauts brought into the station instrument from the micro-meteorite recording system, cassettes with polymer, optic and other structural materials and a set of cassettes with biopolymers. Performed an inspection of the structural elements and clamps, television reporting.
39, 40.	V. Ryumin, USSR; V. Lyakhov, USSR	Soyuz-32—Salyut-6	15 Aug 79, 1 hr 23 min	Detachment and removal of KRT-10 radiotelescope antenna, dismantling of scientific gear installed on outside of station. Cosmonauts continued testing of pressure suits and their systems, checking of new instruments and attachments.
41, 42.	V. Lebedev, USSR; A. Berezovoy, USSR	Soyuz T-5—Salyut-7	30 Jul 82, 2 hr 33 min	Research into possibility of performing mounting operations using instruments. Dismantling and partial replacement of scientific gear.
43, 44.	S. Masgreve, USA; D. Peterson, USA	Challenger	7 Apr 83, 4 hr 10 min	Testing of pressure suits. Movement of astronauts along spars to rear wall of payload compartment and inspection of liquid-fuel engine. Imitation of emergency closing of payload compartment doors and emergency retraction of antenna.
45, 46.	A. Aleksandrov, USSR; V. Lyakhov, USSR	Soyuz T-9—Salyut-7	1 Nov 83, 2 hr 50 min; 3 Nov 83, 2 hr 50 min	The cosmonauts used both spacewalks to install two additional sections on the central solar-panel array.

No.	Cosmonaut, Country	Spacecraft, Orbital Station	Date, Time Outside	Basic Results
47, 48.	B. MacCandless, USA; R. Stuart, USA	Challenger	7 Feb 84, 5 hr 55 min; 9 Feb 84, 6 hr 02 min	B. MacCandless, and then R. Stuart, conducted tests of the individual backpack MMU jet system for autonomous flight during the first spacewalk. The maximum distance from the ship without a safety cord was 97.5 meters. Experiments in docking the MMU with a trunnion mounted on the starboard side of the payload compartment. The second spacewalk had experiments for docking with trunnions on the SPAS-1A satellite platform and in the payload compartment, as well as imitation of refueling the Landsat-IV satellite. Work with instrument pods.
49, 50.	D. Nelson, USA; D. van Hoften, USA	Challenger	8 Apr 84, 2 hr 48 min; 11 Apr 84, 7 hr 18 min	The astronauts went through the airlock into the payload compartment and fastened the docking device to the forward part of the MMU installation during the first spacewalk. D. Nelson performed an autonomous spacewalk to the spinning SMM satellite. All attempts to capture it using the device on the trunnion, as well as by remote manipulator, were unsuccessful. The second spacewalk had the first successful repair of the SMM satellite in orbit. The replacement of a faulty unit in the equipment of the orientation system and an electronic unit. Installation of screen for soft X-ray emissions on polychromator. Test (50 min) of MMU devices in payload compartment by D. van Hoften.
51, 52.	V. Solovyev, USSR; L. Kizim, USSR	Soyuz T-10—Salyut-7	23 Apr 84, 4 hr 15 min; 26 Apr 84, 5 hr 00 min; 29 Apr 84, 2 hr 45 min; 4 May 84, 2 hr 45 min; from 18 to 19 May 84, 3 hr 05 min	V. Solovyev and L. Kizim specified the location of an air leak in the backup line of the station ODU, repaired it and installed additional ODU lines in five spacewalks. The cosmonauts also installed two additional sections on the side panel of the solar battery.
53, 54.	V. Dzhanibekov, USSR; S. Savitskaya, USSR	Soyuz T-12—Salyut-7	25 Jun 84, 3 hr 35 min	Testing of all-purpose manual electron-beam device intended for cutting, welding and soldering metals and applying metallic coatings. The first spacewalk by a woman.
55, 56.	V. Solovyev, USSR; L. Kizim, USSR	Soyuz T-10—Salyut-7	8 Aug 84, 5 hr 00 min	Completion of repairs on ODU, repressurization of non-airtight line.
57, 58.	D. Listma, USA; K. Sullivan, USA	Challenger	11 Oct 84, 3 hr 27 min	Rehearsal in payload compartment of operations necessary for refueling Landsat-IV type satellites in orbit. First spacewalk by U.S. woman astronaut.
59, 60.	D. Allen, USA; D. Gardner, USA	Discovery	12 Nov 84, 6 hr 24 min; 14 Nov 84, 5 hr 42 min	Two spacewalks for the purpose of removing the Palapa B-2 and Westar VI satellites from non-standard orbits and returning them to Earth in the payload compartment. D. Allen, using the MMU apparatus, closed on the Palapa B-2, linked up with it, stopped its rotation and brought the satellite to the access. The astronauts spent over 90 minutes attaching the satellite by hand due to flaws in the manipulator, until D. Gardner finally attached it to the special platform. The second spacewalk took on the Westar VI satellite roughly according to the same routine as for the first spacewalk.
61, 62.	D. Griggs, USA; D. Hoffman, USA	Discovery	16 Apr 85, 3 hr 10 min	Unplanned spacewalk to install attachment on the manipulator arm for the purpose of repairing the Lisat-3 satellite. Attempts to restore the operability of the satellite were unsuccessful.

(Conclusion to follow)

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Selected Aviation Records in Guinness Book

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[Unattributed feature: "AVIATSIYA I KOSMONAVTIKA in the Guinness Book of Records"]

[Text] ** Fastest in the world—The French Dassault Mirage IV operational bombers, which can fly at a speed of 2,333 km/hr (Mach 2.2) at an altitude of 11,000 meters. The American General Dynamics FB-111A has a top speed of Mach 2.5, while the Soviet swing-wing Tupolev Tu-22M, known to NATO as the Backfire, flies at a speed of Mach 2.0 but can reach a speed of Mach 2.5.

** Aircraft with the largest wingspan in the world—The Hughes H4 Hercules flying boat (Spruce Goose), which reached an altitude of 21.3 meters and flew 914 meters in the harbor at Long Beach, California, on 2 Nov 47, piloted by Howard Hughes (1904-1976). The aircraft, which cost 40 million dollars, had a wingspan of 97.51 meters and a length of 66.64 meters. It never flew again as such. The heroic attempt of the Gold Coast Corporation to move the hull of the aircraft to its place of "rest" using the YD-171 barge crane undertaken on 22 Feb 82, however, was crowned with success. Today it rests 9.6 kilometers from the gulf under a dome 213.4 meters in diameter.

** The aircraft Solar Challenger, operating on solar power and created by a group under the leadership of Doctor Paul Macready, made its first flight receiving power only from the sun on 20 Nov 80. The Solar Challenger, piloted by Steve Ptacheck (USA), became the first aircraft of this class to fly across the English Channel on 7 Jul 81. Taking off from Pontois-Cormeis, Paris, the aircraft flew 262.3 kilometers to Menston, Kent, in 5 hours 23 minutes. The maximum altitude of the flight was 3,353 meters. The wingspan of the aircraft is 14.3 meters.

** An official speed record—3,529.56 km/hr—was set by Capt Eldon V. Jorsh and Maj May George T. Morgan Jr. in the Lockheed SR-71A aircraft around the military air base at Beale, California, on the leg of the flight from 15 to 25 kilometers on 28 Jul 76.

** The highest speed that a person has been able to move in space thus far is equal to 39,897 km/hr. This speed was reached at an altitude of 121.9 kilometers by the command module of the Apollo-10 spacecraft when returning to Earth on 26 May 69, with Air Force Col Thomas Patten Stafford, Commander Eugene Henry Cernan and Navy Commander John Watts Young on board.

The speed record for women, 28,115 km/hr, was established on 16 Jun 63 in the Vostok-6 spacecraft by Valentina Vladimirovna Tereshkova (USSR) (born 6 Mar 37). The top flight speed for a woman pilot in an aircraft of 2,687.42 km/hr was recorded on 2 Jun 75 and belongs to Svetlana Savitskaya (USSR).

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